The New England JOURNAL of MEDICINE

FORMERLY THE BOSTON MEDICAL AND SURGICAL JOURNAL

OFFICIAL ORGAN OF
THE MASSACHUSETTS MEDICAL SOCIETY
THE NEW HAMPSHIRE MEDICAL SOCIETY—THE VERMONT STATE MEDICAL SOCIETY
THE NEW ENGLAND SURGICAL SOCIETY—THE BOSTON SURGICAL SOCIETY, INC.
THE NEW ENGLAND PEDIATRIC SOCIETY AND
THE NEW HAMPSHIRE SURGICAL CLUB

OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 199, Number 26 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $7.56 | DECEMBER 27, 1928 | Published Weekly in Boston at 126 Massachusetts Avenue

CONTENTS

A Note on the Continuous Humming Murmur Heard in the Supra- and Infraclavicular Fossae and Over the Manubrium Sterni in Children. *Robert S. Palmer* and *Paul D. White* 1297

Anuria—Due to Pelvic Abscess. *H. C. Clifton* and *B. B. Landry* 1300

A Study of 370 Deaths of Primiparae. *Mary F. DeKruif* 1302

Paroxysmal Headache II. Observations on the Etiology, Symptomatology, and Treatment of the Migrainous State. *C. W. McClure* and *Mildred E. Huntsinger* 1312

THE VERMONT STATE MEDICAL SOCIETY

Acidosis and Alkalosis. *James L. Gamble* 1318

Report of Bennington County Medical Society (Meeting November 28) 1323

Report of Windham County Medical Society (Meeting November 14) 1323

Vermont Department of Public Health, Report for November, 1928 1324

University of Vermont Medical College Notes 1324

Chittenden County Clinical Society, December 6. 1324

The County Medical Society 1337

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 14451—Foul Sputa and Pain in the Right Chest. *Richard C. Cabot.* Case 14452—Discussion of a Case of Type I Pneumococcus Pneumonia. *Frederick T. Lord* 1325

Index—Volume XIV-(1928) 1331

EDITORIALS

Factors in the Decay of Teeth 1335

National Committee for Mental Hygiene 1335

The Annual Registration of Physicians 1336

This Week's Issue 1337

(Contents continued on next page)

New Edition—Graves' Gynecology

Here is a book for practitioner, gynecologist, and general surgeon. For the practitioner, because more than half the book is devoted to non-surgical procedures—treatments within the realm of the general physician, treatments which may be instituted in the office. For the gynecologist and surgeon, because operative technic is detailed and strikingly illustrated.

The new edition reflects the recent progress along the lines of physiology and oncology. These advances necessitated radical changes in the chapters on the physiology of menstruation and ovulation, endocrinology, organotherapy, the vagina and the Fallopian tubes. The entire subject of gynecologic tumors was rewritten, including a new classification of ovarian tumors. There are new chapters on cancer etiology and its practical application to pelvic cancer; on the radium treatment of surgical cancer based on the work of the French school; the relationship of gynatresia to cancer; the lead treatment of cancer, etc. Endometriosis occupies a monograph. The entire subject of sterility was rewritten. Other new material includes diathermy, protein therapy, the sedimentation test, leukoplakia and kraurosis and their relation to cancer of the vulva; constitutional leukorrhea. Several new gynecological operations are described and important changes in the operations for procidentia and retroversion, and in the radium treatment of cancer of the cervix are included.

Octavo volume of 1016 pages, with 562 illustrations, 128 in colors. By WILLIAM P. GRAVES, M.D., Professor of Gynecology at Harvard Medical School. Cloth, $10.50 net.

W. B. SAUNDERS COMPANY **Philadelphia and London**

Entered at the Postoffice at Boston as Second Class Matter

CONTENTS

(Continued)

BOOK REVIEWS
Diabetic Manual for Patients. Henry J. John 1352
Precis de Pathologie Chirurgicale 1351
Text-Book of Surgery. W. Wayne Babcock .. 1352
Urology. Edward L. Keyes 1351

BOOKS RECEIVED FOR REVIEW 1352

BOSTON MEDICAL LIBRARY
Campaign Progress 1337

CORRESPONDENCE
The Annual Registration of Physicians. Samuel B. Woodward, Max Baff 1344

MASSACHUSETTS LEGISLATIVE NOTES, 1929 1342

MISCELLANY
Famous British Medical Authority Cautions American Public 1340
Hearings Conducted by the Board of Registration in Medicine 1338
Noise 1342
Patients in State Hospitals for Mental Disease: 1927. Connecticut & Rhode Island 1340
Resume of Communicable Diseases in Massachusetts, November 1928 1339
A Statement Submitted to the Press by Dr. George H. Bigelow, Commissioner of Health. (Rabies.) 1338
Tear Gas Used in New Fumigation Method .. 1340
United States Public Health Service 1341

NOTICES 1346

OBITUARY 1346

RECENT DEATH 1345

REPORTS AND NOTICES OF MEETINGS 1346

SOCIETY MEETINGS 1350

The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held in Boston, June 11 and 12, 1929, "unless otherwise ordered by the Council."

OFFICERS AND STANDING COMMITTEES ELECTED BY THE COUNCIL, JUNE 5, 1928

PRESIDENT: JOHN M. BIRNIE, 14 Chestnut St., Springfield.
VICE-PRESIDENT: PEER P. JOHNSON, 163 Cabot St., Beverly.
SECRETARY: WALTER L. BURRAGE, 182 Walnut St., Brookline.
TREASURER: ARTHUR K. STONE, Auburn St., Framingham Center.

STANDING COMMITTEES FOR 1928-1929

COMMITTEE OF ARRANGEMENTS
James Hitchcock, E. P. Hayden, H. Q. Gallupe, T. H. Lanman, F. H. Colby.

COMMITTEE ON PUBLICATIONS
Homer Gage, John W. Bartol, R. I. Lee, R. B. Osgood, E. W. Taylor.

COMMITTEE ON MEMBERSHIP AND FINANCE
D. N. Blakely, Algernon Coolidge, Samuel Crowell, Gilman Osgood, Homer Gage.

COMMITTEE ON ETHICS AND DISCIPLINE
David Cheever, W. D. Ruston, S. F. McKeen, Kendall Emerson, A. C. Smith.

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS
P. P. Johnson, A. G. Howard, R. L. DeNormandie, H. P. Stevens, C. H. Lawrence.

COMMITTEE ON STATE AND NATIONAL LEGISLATION
J. M. Birnie, A. W. Marsh, T. J. O'Brien, F. E. Jones, Shields Warren.

COMMITTEE ON PUBLIC HEALTH
Dwight O'Hara, E. F. Cody, R. I. Lee, T. F. Kenney, F. G. Curtis.

COMMITTEE ON MALPRACTICE DEFENSE
F. G. Balch, E. D. Gardner, F. B. Sweet, R. P. Watkins, A. W. Allen.

OFFICERS OF THE SECTIONS FOR 1929

ELECTED BY THE SECTIONS

SECTION OF MEDICINE
Chairman, Lester C. Miller, Worcester; *Secretary*, Roger W. Schofield, Worcester.

SECTION OF SURGERY
Chairman, Philemon E. Truesdale, Fall River; *Secretary*, L. S. McKittrick, Boston.

SECTION OF TUBERCULOSIS
Chairman, John B. Hawes, 2nd, Boston; *Secretary*, Walter A. Griffin, Sharon.

SECTION OF PEDIATRICS
Chairman, C. A. Sparrow, Worcester; *Secretary*, Joseph Garland, Boston.

SECTION OF OBSTETRICS AND GYNECOLOGY
Chairman, Frederick L. Good, Boston; *Secretary*, Louis E. Phaneuf, Boston.

SECTION OF RADIOLOGY AND PHYSIOTHERAPY
Chairman, William D. McFee, Haverhill; *Secretary*, P. F. Butler, Boston.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES

ELECTED BY THE DISTRICT MEDICAL SOCIETIES BETWEEN APRIL 15 AND MAY 15, 1928

BARNSTABLE—*President*, S. M. Beale, Jr., Sandwich; *Vice-President*, H. D. Handy, Harwich; *Secretary*, J. L. Chute, Osterville; *Treasurer*, H. B. Hart, Yarmouthport; *Librarian*, E. E. Hawes, Hyannis.

BERKSHIRE—*President*, C. H. Richardson, Pittsfield; *Vice-President*, M. S. Elsner, Pittsfield; *Secretary*, H. J. Downey, Pittsfield; *Treasurer*, C. T. Leslie, Pittsfield.

BRISTOL NORTH—*President*, F. H. Dunbar, Mansfield; *Vice-President*, T. J. Robinson, Taunton; *Secretary*, J. L. Murphy, Taunton; *Treasurer*, J. V. Chatigny, Taunton.

BRISTOL SOUTH—*President*, J. G. Hathaway, New Bedford; *Vice-President*, G. L. Richards, Fall River; *Secretary and Treasurer*, G. E. Borden, Fall River.

ESSEX NORTH—*President*, G. E. Kurth, Lawrence; *Vice-President*, R. L. Toppan, Newburyport; *Secretary and Treasurer*, J. Forrest Burnham, Lawrence.

ESSEX SOUTH—*President*, O. S. Pettingill, Middleton; *Vice-President*, C. L. Curtis, Salem; *Secretary*, R. E. Stone, Beverly; *Treasurer*, Andrew Nichols, 3d, Danvers; *Librarian*, C. M. Cobb, Lynn.

FRANKLIN—*President*, W. K. Clark, Greenfield; *Vice-President*, H. M. Kemp, Greenfield; *Secretary and Treasurer*, Charles Moline, Sunderland.

HAMPDEN—*President*, E. P. Bagg, Jr., Holyoke; *Vice-President*, Dudley Carleton, Springfield; *Secretary and Treasurer*, H. L. Smith, Springfield.

HAMPSHIRE—*President*, F. E. O'Brien, Haydenville; *Vice-President*, L. B. Pond, Easthampton; *Secretary and Treasurer*, L. O. Whitman, Northampton; *Librarian*, F. H. Smith, Hadley.

MIDDLESEX EAST—*President*, D. T. Buzzell, Wilmington; *Vice-President*, F. T. Woodbury, Wakefield; *Secretary*, A. R. Cunningham, Winchester; *Treasurer*, Richard Dutton, Wakefield; *Librarian*, J. M. Wilcox, Woburn.

MIDDLESEX NORTH—*President*, J. H. Lambert, Lowell; *Vice-President*, A. G. Scoboria, Chelmsford; *Secretary*, T. A. Stamas, Lowell; *Treasurer*, M. D. Bryant, Lowell; *Librarian*, P. J. Meehan, Lowell.

MIDDLESEX SOUTH—*President*, A. W. Dudley, Cambridge; *Vice-President*, Fresenius Van Nuys, Weston; *Secretary*, S. M. Biddle, Cambridge; *Treasurer*, Edward Mellus, Newton.

NORFOLK—*President*, Victor Safford, Jamaica Plain; *Vice-President*, S. F. McKeen, Brookline; *Secretary*, F. S. Cruickshank, Dorchester; *Treasurer*, G. W. Kaan, Reading.

NORFOLK SOUTH—*President*, D. A. Bruce, Atlantic; *Vice-President*, G. M. Sheahan, Quincy; *Secretary, Treasurer and Librarian*, N. R. Pillsbury, South Braintree.

PLYMOUTH—*President*, T. H. McCarthy, Brockton; *Vice-President*, F W. Murdock, Brockton; *Secretary and Treasurer*, L. B. Packard, Brockton; *Librarian*, J. H. Waller, State Farm.

SUFFOLK—*President*, Lincoln Davis, Boston; *Vice-President*, W. H. Robey, Boston; *Secretary*, A. H. Crosbie, Boston; *Treasurer*, John Rock, Boston.

WORCESTER—*President*, P. H. Cook, Worcester; *Vice-President*, A. M. Shattuck, Worcester; *Secretary*, C. A. Sparrow, Worcester; *Treasurer*, G. O. Ward, Worcester; *Librarian*, A. C. Getchell, Worcester.

WORCESTER NORTH—*President*, J. H. Kearney, Fitchburg; *Vice-President*, C. S. Brigham, Leominster; *Secretary*, C. H. Jennings, Fitchburg; *Treasurer*, F. H. Thompson, Jr., Fitchburg.

Fellow Members! We want your support.

Accurate digitalis dosage by mouth

DIGITAN TABLETS

CONVENIENT DEPENDABLE

STANDARDIZED

Sample sent upon request

MERCK & CO. INC.

Main Office • Rahway, N. J.

Vermont State Medical Society

OFFICERS FOR 1928-1929

PRESIDENT: CHARLES F. DALTON. VICE-PRESIDENT: GEORGE ANDERSON. SECRETARY: WILLIAM G. RICKER.
TREASURER: DAVID MARVIN. AUDITOR: W. M. JOHNSTONE.

COUNCILLORS—1st District: T. A. McCormick, St. Albans. 2nd District: E. A. Tobin, North Bennington. 3rd District: F. E. Farmer, St. Johnsbury. 4th District: M. F. McGuire, Montpelier.

EXECUTIVE COMMITTEE—W. G. Ricker, A. L. Miner, James Hamilton.

PUBLICATION COMMITTEE: W. G. Ricker, C. F. Dalton, J. A. Wark.
LEGISLATIVE COMMITTEE: C. H. Beecher, T. S. Brown, M. F. McGuire.
MEDICAL EDUCATION: A. B. Bisbee, H. S. Goodall, S. W. Hammond.

NECROLOGY COMMITTEE: L. A. Russlow, B. D. Adams, H. S. Pierce.
MEDICO-LEGAL: E. A. Hyatt, J. N. Jenne, Wm. Bryant.
HEALTH AND PUBLIC INSTRUCTION COMMITTEE: P. E. McSweeney, E. J. Quinn, H. F. Taylor, A. L. Patch, C. F. Dalton.

DELEGATES

MAINE: F. E. Farmer.
NEW HAMPSHIRE: O. W. Daley.
A. M. A.: William G. Ricker.

MASSACHUSETTS: A. C. Black.
CONNECTICUT: B. A. Chapman.

RHODE ISLAND: Charles Buchanan.
NEW YORK: John D. Lane.
ALTERNATE A. M. A.: C. H. Beecher.

HOUSE OF DELEGATES

President: B. D. Adams. Vice-President: L. H. Ross. Second Vice-President: H. G. Ripley. Secretary: J. E. O'Brien.

NEW ENGLAND MEDICAL COUNCIL

C. F. Dalton, William G. Ricker, E. A. Hyatt, F. E. Farmer, J. A. Stevenson.

ANNIVERSARY CHAIRMAN: J. H. Blodgett.

The 116th Annual Meeting of the Vermont State Medical Society will be held at Bellows Falls, October 10-11, 1929.

New Hampshire Medical Society

OFFICERS FOR 1928-1929

PRESIDENT: JOSEPH J. COBB, Berlin. VICE-PRESIDENT: HENRY O. SMITH, Hudson. SECRETARY-TREASURER: D. E. SULLIVAN, Concord.

COUNCILORS: Clifton S. Abbott, Belknap County; Arthur T. Downing, Grafton County; A. A. Pratte, Cheshire County; Emery M. Fitch, Sullivan County; Henry H. Amsden, Merrimack County; George C. Wilkins, Hillsborough County; Abram W. Mitchell, Rockingham County; Harry O. Chesley, Strafford County; H. H. Marks, Coos County; F. E. Clow, Carroll County.

TRUSTEES: Alpha H. Harriman, Laconia; Ira J. Prouty, Keene; Thomas W. Luce, Portsmouth.

HOUSE OF DELEGATES: Speaker, Elmer H. Carleton, Hanover; Vice-Speaker, Harry O. Chesley, Dover.

STANDING COMMITTEES

SCIENTIFIC WORK: D. E. Sullivan, H. A. Des Brisay, F. P. Scribner.
PUBLIC POLICY AND LEGISLATION: Fred E. Clow, Emery M. Fitch, Charles Duncan, the President, the Secretary-Treasurer.
PUBLICATION: D. E. Sullivan, H. H. Amsden, Raymond H. Marcotte.
ARRANGEMENTS: Hillsborough County Medical Society.
TUBERCULOSIS: R. B. Kerr, R. W. Deming, A. L. Wallace.

MENTAL HYGIENE: Benjamin W. Baker, Charles H. Dolloff, Leslie B. McKinley.
HOSPITAL STANDARDIZATION: John C. Lawlor, John P. Bowler, Eugene B. Eastman.
CONTROL OF CANCER: Fred E. Clow, George C. Wilkins, H. N. Kingsford.

DELEGATES TO STATE SOCIETIES

MAINE: Homer H. Marks. VERMONT: Oscar C. Young. MASSACHUSETTS: James T. Greeley.
CONNECTICUT: Richard W. Robinson. RHODE ISLAND: Deering G. Smith.

The next Annual Meeting will be held in Manchester, Tuesday and Wednesday, May 28-29, 1929

Help us to make the Journal excel as an advertising medium.

TILTOMETER

as used and recommended by DR. PITKIN

We are headquarters for supplies for spinal and local anesthesia and have in stock the various items described by Drs. Pitkin, Sise, Labat, etc.

E. F. MAHADY COMPANY

USE THIS COUPON FOR AN ORDER OR TO OBTAIN FURTHER INFORMATION

E. F. MAHADY CO., 851 *Boylston Street,* BOSTON, MASS.

Please send me the following

.....Tiltometers at $5.00

.....Boxes Spinocain at $5.00

.....Pitkin Spinal Needles 20g 3½ in. at $1.50

.....Pitkin Spinal Needles 22g 3 in. at $1.50

.....#3P Pitkin Sets at $8.75
(2 Spinal Needles, 2 Syringes, 2 Needles for Wheal—all in metal case)

.....Lahey Clinic (Sise) Needle Sets at $2.50
(1 Spinal needle and 1 introducer)

NAME..... ADDRESS.....

BE WELL HEALTH BREAD

In Cracker Form With Real Food and Medical Value

Endorsed by Physicians and Dietitians

All Physicians and Dietitians not now familiar with this product should send for a 1½ pound large and two small packages which we will gladly send free to any address on request.

Wm. Rydberg's Baking Co.

146-150 Harvard Street

CAMBRIDGE, MASSACHUSETTS

The pick of New England's choicest herds produce Walker-Gordon Certified Milk.

The BABIES

of

"1929"

Deserve the Best Milk Obtainable

Physicians everywhere can testify to the High Character and Quality of Walker-Gordon Laboratory Products and Service.

WHITING MILK COMPANIES

Distributors

BOSTON PROVIDENCE

WORCESTER

Calcreose

For Bronchitis and Tuberculosis

CALCREOSE confers all the benefits of creosote medication with gastric disturbance largely eliminated.

CALCREOSE can be given in large doses for long periods without apparent difficulty. Try it.

Powder : Tablets : Solution

Sample of tablets on request

THE MALTBIE CHEMICAL CO. **Newark, New Jersey**

Manufacturers of a full line of pharmaceutical products

SPEECH DEFECTS

are usually correctable. All kinds of speech defects are being successfully treated. Individual instruction. Write for descriptive booklet.

Samuel D. Robbins, Director, Stammerers' Inst.

624 Warren Chambers, 419 Boylston St., Boston, Tel. Kenmore 6800

927 Hospital Trust Bldg., Providence, R. I. Telephone Gaspee 7118

MRS. L. L. STURTEVANT
1243 Beacon Street
Brookline, Mass.

CONVALESCENT HOME
Special Care of Convalescent, Invalid and Elderly People. Staff of Trained Nurses in Attendance Day and Night.

References: Physicians
Tel. Aspinwall 2089 and Regent 8189
B504-24-52t

THE CLARKE SCHOOL
A Select Suburban Home School for the Exceptional Boy or Girl
Individual Training Under Special Teachers
DIRECTOR
EDITH G. CLARKE, B.S.
16 Summit St., Newton, Mass.
EIGHT MILES FROM BOSTON

DOCTORS ARE INVITED
. . . to visit our studio, thoroughly investigate our qualifications, and use our services just as if we were physiotherapy aides in their own offices.

Our physical therapy treatments for the sick are given only on physician's prescription—specializing on electrotherapy, massage, and colonic irrigation.

The Physical Therapy Studio
Katherine McMahon Fitzpatrick, R.N., *Director*
at Hotel Kenmore
Tel. KEN more 2770 B79-19-tf

FOR SALE—Practise established 20 years in town 27 miles from Boston. If you can finance a $15,000 proposition this is your opportunity to take over a $14,000 a year practise, for the price of real estate. Modern office 4 rooms. House 9 rooms and bath, silent automatic oil heater, 2-car garage. Address A51, Care of N. E. J. of M. 23-4t

Why not Advertise in the NEW ENGLAND JOURNAL OF MEDICINE?

SITUATIONS WANTED

WANTED: Salaried Appointments for Class A physicians in all branches of the Medical Profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Asmoe's National Physicians' Exchange, 30 North Michigan, Chicago. Established 1896. Member The Chicago Association of Commerce.

REST HOUSE
THE HOMESTEAD
West Roxbury—Tel. Parkway 2455
A private country home, ideal for resting and building up and for mild convalescence only—nervous, medical or surgical. Constructive care and direction. Eight patients. Rates $40.00 to $60.00. References.
Maud H. Roscoe, R. N.
B71-14-26t

TO SUBLET—One room in a suite in the Lister Building. Apply to Dr. Samuel R. Meaker, 475 Commonwealth Avenue, Boston. B70-23-4t

Collection of accounts for the medical profession.
Personal service and individual work on every account.

COMMERCIAL COLLECTION AGENCY

718 Little Bldg.	**Transfer Building**
80 Boylston St.	**12 Weir St.**
Boston, Mass.	**Taunton, Mass.**
Tel. Han. 8794	**Tel. 3420**

B82-20-eow-tf

NOTICE

The Journal would like to buy the following:

4 copies, Nov. 29, 1928.

We will pay 20c for these copies of the Journal. After we have received the desired number of each issue we shall be obliged to return any extra numbers sent us.

FOR RENT—Beautiful 6-room apartment, Suite 1, 407 Marlboro St., suitable for doctor's office or residence. Newly decorated. Also suite 4 (seven rooms) in same building. Telephone owner Hancock 1400, Room 748. B78-18-tf

FOR RENT—Furnished apartment, four rooms and bath including office of the late DR. JOHN DUFF, 5 Dexter Row, Thompson Square, Charlestown. Telephone Charlestown 0320. Office rented separately if desired. B72-15-tf

WANTED—Intern—100 bed—Class A Hospital. One who has had previous hospital experience and can give satisfactory references will be paid salary. Address A46, Care of N. E. J. of M. 22-tf

Classified Advertising at the Following Rates:

(a) 20c per 6 point line for single insertion.
(b) 20c per 6 point line for first insertion, 15c for 2nd insertion, when ordered twice.
(c) 20c per 6 point line for first insertion, 15c for 2nd insertion, 15c for 3rd insertion, 15c for 4th insertion and 10c for 5th insertion and thereafter when ordered for more than 4 times.

6 words to a line, 2¼ inches long.

ANCIENT BELIEFS WHICH HAVE BEEN EXPLODED

(1) A child with measles should be kept in the dark.
(2) The bedroom window should be kept closed because the night air is dangerous.
(3) A mother must lose a tooth for every baby.
(4) Baby teeth need no attention because they will be lost eventually.
(5) Bow legs occur because the child walks too soon.
(6) Birth marks result from some shock to the mother during pregnancy.
(7) Tuberculosis is inherited.
(8) A child with defective tonsils may outgrow them.
(9) Carrying a horse chestnut will cure rheumatism.
(10) It is just as well for the child to contract measles in infancy because the sooner the better.
—Buffalo Sanitary Bulletin.

CENTRAL DIRECTORY SUFFOLK COUNTY NURSES
420 BOYLSTON ST.—Rooms 325-326
BOSTON, MASS.
Telephone—Kenmore 3340
Registered Nurses, Men and Women
Hourly Nurses
Undergraduate Nurses
Day and Night Service
Attention Paid to Individual Preferences in Choice of Nurses
No Fee to Patrons

EXTERMINATION
Of Vermin & Terminal Fumigation
By
SAFTI-FUME PRODUCTS
FOR HOUSEHOLD USE
or SAFTI-FUME SERVICE
BY EXPERIENCED AND RESPONSIBLE OPERATORS
Safti-Fume, which is 100 per cent. efficient and also safe in every respect, destroys Fleas, Roaches, Bed Bugs, Rodents, Buffalo and Common Moths in Rooms, Homes, Hospitals, Infirmaries, Culinary Departments, Nurses' Quarters, Mess Rooms, and Contagious Wards.
Let us know your vermin problem and we will explain in detail how Safti-Fume is used.
SAFETY FUMIGANT CO.
73 LONG WHARF BOSTON, MASS.
Tel. HUB bard 9624

Why Not Use A Temporary Binder?

It is often difficult and sometimes impossible for us to supply missing numbers. Our files are frequently exhausted. It is usually the lost copy that contains the articles needed for reference.

We suggest that you purchase a binder for the current volume. The copies can be easily removed when you are ready for a permanent binding.

This has been found to be a very convenient method of preserving Journals and we are pleased to offer it for your consideration. The cost is $2.25 plus delivery charges.

The New England Journal of Medicine

(Formerly the Boston Medical and Surgical Journal)

126 Massachusetts Avenue
Boston

National Protective Companies

Capital Stock

RIDGELY PROTECTIVE ASSOCIATION
OF WORCESTER, MASS.

LOYAL PROTECTIVE INSURANCE COMPANY
OF BOSTON, MASS.

which are subsidiaries, have successfully written health and accident insurance for over thirty years.

Board of Directors

E. M. ALLEN, *Vice President, National Surety Co.*
ALLAN FORBES, *President, State Street Trust Co.*
C. M. GOODNOW, *President, Loyal Protective Insurance Co.*
MELVILLE F. HEATH, *President, Ridgely Protective Association*
JOHN HOAR, *Treasurer, National Protective Companies*
J. AMORY JEFFRIES, *Childs, Jeffries & Co.*
J. LOTHROP MOTLEY, *Storey, Thorndike, Palmer & Dodge*
THOMAS MOTLEY, *Curtis & Sanger*
FRANCIS R. PARKS, *Secretary, Loyal Protective Insurance Co.*
BAYARD TUCKERMAN, JR., *OBrion, Russell & Co.*

Price $41.50 per Share

A Descriptive Circular giving earnings and complete information sent on request

KENMORE BRANCH
645 Beacon St.

CURTIS & SANGER

NEW YORK CITY
49 Wall Street

Members New York and Boston Stock Exchanges
33 CONGRESS STREET, BOSTON

Ice Cold Fishing Grounds close to shore ~

insure the freshness of all Cod Livers used in making Nason's Cod Liver Oil. Here at the Lofoden Islands far north of the Arctic Circle, fine Cod are caught and the oil immediately extracted in below freezing temperature at Nason's own Cod Liver Oil Plants.

The waters, however, do not freeze due to the kindly influence of the Gulf Stream.

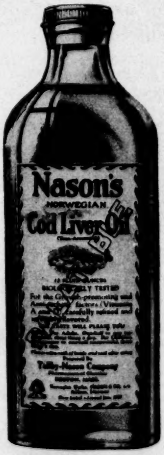
These facts, together with the perfection of Nason's methods of extraction, account for the quality and potency of Nason's Cod Liver Oil. The addition of a minute quantity of special flavor renders the finished product unusually palatable for old and young.

Write for sample bottle and proof of Vitamin potency

TAILBY-NASON COMPANY
Kendall Square Station - Boston, Mass.

Pharmaceutical Manufacturers to the Profession of Medicine and Pharmacy since 1905

N.E.J. 12-28



Nason's
Palatable - Norwegian
Cod Liver Oil

Therapeutic and Ultra-Violet Lamps

CROWLEY & GARDNER

Surgical, Hospital and Sick Room Supplies

735 Boylston St., Boston

C. A. FREES

Established 1866

ARTIFICIAL LIMBS

Trusses, Elastic Hosiery and Belts

Every limb is especially made for each Individual Case
Our latest model embodies every natural heel and toe movement.

Write for catalog.

BOSTON
564 Washington St., Tel. Hancock 5936
Also New York and Chicago

WE WILL BUY:

American Glue Com.
El Dorado Refining Units
Insurance & Bank Stocks
Johnson Educator "A" & "B"
Old Colony Trust Associates

CHAS. A. DAY & CO.

INCORPORATED

SEARS BLDG., BOSTON
199 Washington St. Tel. Hubbard 0685

PINKHAM & SMITH COMPANY

Established 1896

DISPENSING OPTICIANS

Thirty-two years
devoted to dispensing glasses
as prescribed by

EYE PHYSICIANS

Artificial Eyes Fitted and made to order

292 Boylston St. and 15 Bromfield St.
BOSTON, MASS.

The Cod Fish Region

DOTTED along the shore line from Cape Cod up to Labrador are the Patch plants, where the fishermen bring in their daily catch of cod fish, and the oil is obtained by promptly cooking the fresh livers.

Because of the far-flung range of these plants and the steam trawlers following the fish into deep water, Patch's Flavored Cod Liver Oil is made when and where the fishing season is right.

Your assurance of therapeutic potency is the vitamin guarantee for both A and D which appears on each bottle of Patch's Flavored Cod Liver Oil. Each lot is biologically tested, to insure your patients a dependable product.

There is a distinctive flavor to

Patch's Flavored Cod Liver Oil

—and the proof of the flavor is in the tasting, so we want you to taste it. Let us send you a bottle, just to give you an agreeable surprise.

THE E. L. PATCH CO.

BOSTON, MASS.

The E. L. Patch Co.,
Stoneham 80 Dept.
Boston, Mass.

Please send me a sample of Patch's Flavored Cod Liver Oil and Literature.

Dr. .....

Address .....

N.E.M.-12

If you do not find dealer in goods you want among our advertisers, please let us know. We will call it to his attention.

Pliant Footwear

We have always specialized in Flexible Arch Footwear. We are offering as usual, both the Full Toe Orthopedic last and the Modified.

The Full Toe is available in Black Kid and Tan Calf Oxfords. The Modified Toe is available in Black Kid and Tan Calf Oxfords, also Brown Kid and Black Kid two-strap Pumps.

Price $11.50---$13.50

Jones, Peterson & Newhall Co.

51 Temple Pl.,

BOSTON, MASS.

Accurate

Dependable

In bottles of 35, intact from laboratory to patient.

More uniform and convenient than tincture drops.

Sample and literature upon request.

DAVIES, ROSE & CO., Ltd., Boston, Mass.

5

INSURANCE

Insurance is a safeguard, and sets the mind at rest,
No one can judge its value until he's had a test.

Note the times you have seen within the past year,
When lack of Insurance has cost good men dear.

"Safety First" is the slogan of the day.
Every one should heed it and that without delay.

"United we Stand—Divided we Fall" an axiom of old.
But it's true and it's trite, and better than gold.

Rely on Insurance, "Safety First" it will be,
With adjustment and counsel complete you will see.

Argument is not needed to convince the wise man,
That a good company helps as nothing else can.

Numbskull is the man who boasts he can plan,
To run affairs by himself as no company can.

Crosbie can tell you just how to proceed,
In these times of accidents and all evil deeds.

Enough! Crosbie remarks, "No more need be said;
But the man without Insurance may be hopelessly bled."

GEORGE H. CROSBIE,

79 Milk Street, Boston, Mass.

NOBSCOT
REG. U.S. PAT. OFF.
SUGAR-LESS
GINGER ALE
MADE WITH SACCHARINE

Prepared under the direction of physicians, for the sole use of persons to whom the use of sugar is prohibited.

We will be pleased to furnish samples upon request to physicians and their patients.

9 Pelham St., Boston, Mass.

Telephone Kenmore 6914

The New England
Journal of Medicine

VOLUME 199 DECEMBER 27, 1928 NUMBER 26

A NOTE ON THE CONTINUOUS HUMMING MURMUR HEARD IN THE SUPRA- AND INFRACLAVICULAR FOSSAE AND OVER THE MANUBRIUM STERNI IN CHILDREN*

BY ROBERT S. PALMER, M.D., † AND PAUL D. WHITE, M.D.†

THE occurrence of a continuous humming murmur heard in the supra- and infraclavicular regions, especially on the right side and over the manubrium sterni, in many children, has long been recognized as a normal phenomenon, but many physicians are still unaware of it. This murmur has been brought to our attention recently because of the possibility of confusing its diastolic phase when transmitted to the aortic area and sternum with a rheumatic aortic diastolic murmur and also because the continuous murmur, especially when well marked and heard on the left side as well as on the right, is very similar to the murmur of congenital patent ductus arteriosus. It is of considerable importance to recognize this "normal murmur" from those pathological ones just mentioned. It is very common in children and is maximal on the right side of the neck with the chin raised and turned to the left. This manoeuvre will often bring it out when not otherwise present in many children and in some adults. It is very similar to the Eustace Smith sign and indeed its mechanism may be much the same.

REVIEW OF LITERATURE

LAENNEC described the murmur as "the bellows sound" and considered its origin to be in the arteries. He observed it in the carotid and subclavian arteries most commonly, and next in order in the crural and brachial arteries (the latter probably a different phenomenon). "The arteries of the right side give the sound more frequently and in greater degree than those of the left side", he observed. He considered the site of origin in the arteries chiefly because of the locations where it was observed. He found it in a variety of subjects, including patients with hemorrhages, cachectic individuals, delicate persons, and nervous patients. The variability of its appearance and its presence with nervousness led him to consider arterial spasm as a cause, and its occurrence in the heart as due to spasm in that organ. In some of the nervous subjects agitation, mental or physical, brought out the bellows sound.

BOUILLAUD, like Laennec, placed the murmur in the arteries, chiefly the carotid and subclavian, because of the location of the murmur, its variability with the arterial pulse, and because compression with the stethoscope sufficient to stop the flow of blood stopped the murmur. This author called it the *bruit du diable*, a name not acceptable to Hope, who considered it too serious to apply to such a harmless sign.

WARD reported five cases presenting the *bruit du diable*, four "being affected with palpitation, and two being chlorotic". He felt that the site of production was in the veins for several reasons: (1) the sound is heard over the course of the external jugulars as well as the carotids; (2) it is solely in the latter position (and not always there) that it appears to be augmented by ventricular systole; (3) it is arrested by pressure on the external jugular and over the carotid artery by a pressure insufficient to occlude the latter; (4) it is increased by pressure and by raising the chin and everting the head, diminishing the caliber of the vein and increasing the velocity of flow; (5) it is stopped by the opposite manoeuvre, shortening the vein; (6) violent or prolonged effort produces regurgitation into the veins and puts a stop to the flow and to the murmur.

HOPE gave Laennec credit for first describing the murmur, though he felt that it was confused with certain cardiac murmurs and that Laennec placed it wrongly in the arteries, as did Bouillaud, following his countryman's example. T. Ogier Ward of Birmingham, in Hope's opinion, "solved the enigma", his solution being "correct in the main, but defective in many particulars—especially in his explanations of several phenomena described by Bouillaud which are themselves incorrect". Hope discussed the murmur at length, the important point being that he could control its appearance and disappearance at will by pressure on the vein insufficient to occlude the artery. He observed a similar continuous murmur in the abdomen, most often above and to the right of the umbilicus on deep pressure.

*From the Children's Cardiac Clinic of the Massachusetts General Hospital.

†For record and address of author see "This Week's Issue," page 1337.

THAYER described a "venous hum" heard in the epigastrium in a patient with portal cirrhosis. He reviewed the literature.

EUSTACE SMITH described a venous hum produced by bending a child's head well back and due, in his opinion, to tilting the lower end of the trachea forward "which carried with it the glands lying in its bifurcation, and the innominate vein, as it passes behind the first bone of the sternum, is compressed between the enlarged glands and the bone". The venous hum is heard over the manubrium sterni.

BROKMAN AND PROKOPOWICZ found the Eustace Smith sign of no importance in the diagnosis of tracheo-bronchial adenopathy. The jugular venous murmur, they concluded, moreover, was only a symptom of a particular state of the walls of the veins, probably physiological.

SAWYER found the so-called venous hum in sixty-five or five hundred children under twelve years. The ages ranged from two and a half to eleven and a half years. Eighteen of the sixty-five were suffering from some affection of the bronchi, twenty-eight were in a debilitated condition, and of the remaining nineteen some malady not connected with any disease of the chest was diagnosed. Turning the chin increased the loudness of the bruit, or brought one out not previously heard. Moreover this increased the bruit over the sternum.

In the forty-eight cases studied by Sawyer in which maximum intensity was noted the hum was loudest on the right side in five, on the left in ten, equal on both sides in thirty. In only one was it loudest over the sternum. Sawyer concluded that the finding was not significant.

LANDIS AND KAUFMAN described the venous hum extending through systole and into diastole. They found it very common in children under fifteen years. The murmur tended to disappear toward and after this age. The murmur is less likely to disappear in recumbency (as is usually the case) if anemia is present. The older literature on this subject is reviewed by the authors. These authors observed the "venous hum" in eighty-four of ninety-nine children under fifteen years old and three of twenty-six patients over sixteen. Of the eighty-four children in which it was heard thirty-nine were anemic and forty-five were not anemic.

MORSE mentions the "murmur which is very often heard over or above the manubrium in infancy and sometimes in childhood. It is most marked when the head is extended". This author believes it to be due to pressure on the innominate veins, which may or may not be due to enlarged bronchial glands or an enlarged thymus. The fact that it can be brought out in almost every infant by extension of the head and its common occurrence otherwise make it of no pathological significance.

SEHAM states that the venous hum is common in normal children, especially those of the school age, and is rare in infancy. The bruit continues through the entire cycle, is heard best over the internal jugular at the inner third of the claviele. It may be soft or loud and harsh. The most generally accepted theory concerning its origin regards it as due to increased tension on the jugular veins from the position of the head. The murmur almost always is diminished or disappears in the prone position and is usually accentuated by moderate pressure with the stethoscope.

Although most writers hold that the murmur arises in the veins, this theory is not proved. The fact that it is so like the murmur of patent ductus arteriosus, the observation that it does, in some cases, persist in spite of occluding the vein, and its great variability in intensity with respiration require further study and observation to determine the exact mechanism of its production. It is possible, as Laennec first thought, that the murmur may arise in the arteries. At any rate the air spaces—trachea, bronchi and lung apices—probably play an important rôle, whatever the vascular origin.

CASE REPORTS

CASE 1. Boy, aged twelve years, referred to the Children's Cardiac Clinic, Massachusetts General Hospital, for diagnosis of his heart condition. The child was rather pale. The heart was normal on physical examination, but there was heard a continuous humming murmur above and below the right clavicle transmitted downward toward the base of the heart. The electrocardiogram showed only sinus arrhythmia. *Diagnosis*: Normal heart.

CASE 2. A girl, aged nine years, seen in private practice. There was in this case a question of patent ductus arteriosus or of aortic valvular disease. She was of good color. The heart was negative on physical examination. The shape of the heart was normal by roentgen ray examination. A continuous humming murmur was heard in the right side of the neck, to the right of the manubrium and was transmitted to the base of the heart. Electrocardiogram showed sino-auricular tachycardia, but no abnormal axis deviation. The murmur had been heard first two years previously and was noted as less intense at the last examination. *Diagnosis*: Normal heart.

CASE 3. A boy, aged eight years, was seen in the Cardiac Clinic of the Massachusetts General Hospital, coming with a diagnosis of questionable rheumatic heart disease (on the basis of a marked musical apical systolic murmur recumbent and a third sound). Patent ductus arteriosus and thymic enlargement were also considered. The child was thin. A marked apical musical systolic murmur and a faint continuous humming murmur were heard, the latter at the inner end of the right clavicle and very loud above it. Roentgen ray examination showed slight prominence of the auricles. The case represents an interesting problem since the possibility of rheumatic heart disease was still entertained, although the most striking physical sign, the continuous murmur, was probably a normal finding.

CASE 4. A boy, five years old, with subacute rheumatic fever, showed on examination the continuous

humming murmur above and below the right clavicle transmitted even to the apex of the heart, where it was faint but exactly the same in time and character. Roentgen ray study showed a shadow consistent with an enlarged thymus gland, though the diagnosis was in doubt. Patent ductus arteriosus had been questioned in this case.

CASE 5. A boy aged eight years, pale and thin in appearance, with subacute rheumatism and mitral regurgitation, showed also a continuous humming murmur in the right side of the neck and under the right clavicle and over the manubrium. The murmur was transmitted somewhat to the left. Roentgen ray study showed increase in the heart shadow in the region of the left auricle and left ventricle. The lung root shadows were increased. The diastolic phase of the continuous murmur had been heard in the aortic area and aortic regurgitation had been wrongly diagnosed.

CASE 6. A boy, aged eight years, with rheumatic heart disease and slight mitral stenosis and regurgitation, showed the continuous humming murmur similar in quality to that resulting from patency of the ductus arteriosus. It was heard under the right clavicle but not along the left sternal border. It was heard faintly in the recumbent position. The heart was enlarged on physical examination and the roentgen ray study revealed leftsided hypertrophy. Aortic regurgitation had been questioned in this case.

CASE 7. A boy, aged fourteen years, with rheumatic heart disease, mitral stenosis and regurgitation, aortic regurgitation and acute nephritis showed the continuous murmur best heard in the right side of the neck, and also the true early blowing diastolic murmur of aortic regurgitation. This child was well developed and nourished, with no pallor. Hemoglobin was seventy per cent. and the red cell count was five million.

CASE 8. A boy, aged seven years, with rheumatic heart disease, mitral stenosis, regurgitation and questionable aortic stenosis showed the continuous hum in the right side of the neck and subclavicular region. He was undernourished. There was slight cardiac enlargement by roentgen ray examination. Light pressure with the finger over the external jugular vein, too light to occlude an artery, appeared to stop the humming murmur. Vascular origin of the murmur was considered present in this case.

CASE 9. A girl, aged nine years, with probable rheumatic mitral regurgitation, showed the continuous humming murmur in the right side of the neck. The child was rather thin and undernourished. There was slight cardiac enlargement by roentgen ray examination, consistent with rheumatic heart disease. The hilus glands were increased. Light pressure over the external jugular insufficient to occlude the carotid artery stopped the murmur.

CASE 10. A boy, aged seven years, with rheumatic heart disease, mitral stenosis and regurgitation and malaria, showed the continuous murmur over the manubrium sterni and in both supraclavicular fossae with head extended. Light pressure over external jugular veins appeared to stop the murmur.

CASE 11. A girl, aged five years, with rheumatic mitral regurgitation and stenosis showed the continuous humming murmur, more marked, as usual, on the right side, though heard on the left also with head extended and chin turned to the opposite side. The child was anemic (hemoglobin fifty per cent., red cells three million) and was subject to infections. The heart was slightly enlarged. On light compression the murmur heard in the left supraclavicular region disappeared, leaving the carotid pulse palpable. A systolic bruit remained, but it was of a quality different from that of the systolic phase of the continuous hum.

CASE 12. A boy, aged seven years, with rheumatic mitral stenosis and regurgitation, showed the continuous humming murmur in the usual position (above and below the right clavicle). He was well nourished and his color was good. Light pressure over the carotid sheath stopped the murmur.

CASE 13. A girl of three years with questionable rheumatic mitral regurgitation showed the continuous humming murmur. There was no cardiac enlargement. The continuous murmur persisted with moderate pressure over the carotid area, though the diastolic phase was diminished by this manoeuvre.

CASE 14. A girl of six years with questionable rheumatic heart disease showed the same continuous hum described in the previous cases. She was well developed and nourished, of good color. The murmur was still heard with moderate pressure over the carotid sheath, though it was diminished. The quality of the murmur varied with respiratory phases.

DISCUSSION

All of these cases were referred to the Cardiac Clinic of the Massachusetts General Hospital, or were seen in private practice for an opinion of the heart condition, or were being followed in the clinic as cardiac or potential cardiac patients. It is in this very group that it is important to recognize the existence of the continuous humming murmur in order to avoid confusing the whole murmur with that of patent ductus arteriosus, as was done three times in this series of fourteen cases, and in order to recognize its diastolic phase when it is transmitted downward to the aortic area. . Aortic regurgitation was wrongly considered in two cases of this series of fourteen.

Further study of a larger series of cases is contemplated in order to reach a more definite conclusion in regard to the mechanism of the production of the murmur.

SUMMARY

Fourteen cases, showing a continuous humming murmur best heard on the right side of the neck, also heard in the infraclavicular fossa, over the manubrium sterni and sometimes on the left side of the neck, have been reviewed in order to call attention to a common physical sign in childhood, which, however, is not usually recognized. In this series of fourteen cases patent ductus arteriosus was wrongly considered three times and aortic regurgitation was wrongly considered twice.

REFERENCES

Bouillaud, Jean Baptiste: Traité Clinique des Maladies du Coeur, Paris, 1835, Vol. I, p. 210.

Brokman, H., and Prokopowicz, M.: Nature of Smith's Sign and Connection of Smith's Sign with Appearance of Venous Murmurs. Rev. franc. de Pediat., 1:439, 1925.

Hope, J.: Diseases of Heart and Great Vessels, 4th Edition, 1849, p. 101.

Laennec, R. T. H.: Treatise on the Diseases of the Chest and on Mediate Auscultation, American Edition, New York, 1830, p. 567.
Landis, H. R. M., and Kaufman, I.: The Occurrence of Venous Hums in Children. Archives of Pediatrics, 29:88, 1912.
Morse, J. L.: Heart Murmurs in Infancy and Childhood. Boston M. and S. Jour., 188:335, 1923.
Sawyer, J. E. H.: Observations on the Bruits Heard over the Manubrium Sterni in Children. Brit. Jour. Dis. of Children, 7:310, 1910.
Seham, Max: Abt's Pediatrics, Isaac A. Abt, Editor, Saunders, Phila. and London, 1924, Vol. IV, p. 253.
Smith, Eustace: The Wasting Diseases of Children, Sixth Ed., 1884, p. 311.
Thayer, W. S.: On the Presence of a Venous Hum in the Epigastrium in Cirrhosis of the Liver. Amer. Jour. Med. Sci., 141:313, 1911.
Ward, T. Ogier: On the Bruit du Diable. London Medical Gazette, 20:7, 1837.

ANURIA—DUE TO PELVIC ABSCESS

BY H. C. CLIFTON, M.D., F.A.C.S.,* AND B. B. LANDRY, M.D., F.A.C.S.*

AMONG the most distressing of post-operative complications is Anuria. Fortunately, it occurs rarely and when it does, usually follows operations on the urinary tract. In reviewing literature on the subject we have failed to find a single reference to the occurrence of this condition as a complication of Acute Appendicitis. Because of this we have considered that a recent such case, with the anuria lasting three days, should be reported. There is nothing unusual about the duration of the total suppression of urine, since cases of much longer periods are numerous in the literature, but the cause we think to be quite unique.

CASE HISTORY

Spencer T., age 9 was admitted to St. Francis' Hospital, Hartford on July 19th about 10 P. M. after being transported from an inland resort 25 miles distant. His chief complaint was pain in the right lower quadrant. His illness began two days previously with pain about the umbilicus which gradually spread over the entire abdomen. Nausea and vomiting followed soon afterwards. When first seen, soon after admission, he was obviously very ill. His physical examination was essentially negative except as to the abdomen, throughout which there was tenderness especially in the right lower quadrant. Spasticity of the abdominal muscles was marked, particularly of those of the right side. His temperature was 102°F, pulse 120, respiration 30. The urine was cloudy, acid in reaction, specific gravity of 1026 with a trace of albumen. There was no sugar and the microscopic examination showed a few pus cells. The white blood count was 22,400 and the differential count was 92% polymorphonuclear leukocytes and 8% round cells.

Because of the long journey and his evident weakness due to it, plus the history of the acute appendiceal condition of two days' duration, it was deemed advisable to withhold operation for several hours. Saline solution was given in the meantime both by rectum and sub-pectorally.

OPERATION THE FOLLOWING MORNING—DR. CLIFTON

Through a 2 1/2 cm. McBurney incision, the peritoneal cavity was opened with the immediate escape of thick foul-smelling pus. The odor was distinctly coliform. The appendix was located coursing downward toward the pelvis. The caecum was delivered with the appendix—the latter being gangrenous and perforated. It was amputated with the actual cautery and following ligation of the meso-appendix, the caecum was replaced within the abdomen, a long cigarette drain was placed down to the pelvis and the wound closed in layers.

*For record and address of author see "This Week's Issue," page 1337.

With return to his room the patient was placed in the Fowler position, saline given by the bowel and nothing ordered by mouth.

For the first four days, considering the serious illness, the child's condition ran a favorable course. His temperature and pulse came down and his intake and output of fluids were abundant. There had not, however, been the amount of drainage expected from the wound.

The last specimen of urine was voided about 7 P. M. on the 23rd of July, the third day post-operative. Increased irritability and drowsiness were noted at this time. On the 24th, catheterization was done without obtaining as much as a drop of urine. The presence of complete suppression was obvious. A pediatric consultant felt, as we did, that it was due either to reflex peritoneal irritation or else acute nephritis. Glucose was given by rectum, intra-venously and sub-pectorally, flaxseed poultices were placed over the abdomen and to both kidney regions, and hot colonic irrigations were administered. During this period, the bowels remained open and good results were obtained from enemata. There was complaint of pain over the bladder region and also over the left kidney region. The abdomen was of a doughy consistency. In addition to the measures mentioned above, preparation for blood transfusion had been made. Outside of drowsiness and irritability and the moderate amount of pain over the left kidney, the patient's condition was by no means precarious.

On July 26th, a rectal examination revealed a collection behind the bladder. No time was lost thereafter in transporting the patient to the Operating Room.

OPERATION—DR. LANDRY

The original incision was enlarged. On putting the finger down behind the bladder, a tense walled-off abscess was felt. On rupturing the wall there was an immediate projection of thin, foul-smelling purulent fluid. Two large stout cigarette drains were placed in the cavity and the wound layers approximated by through and through silkworm gut sutures.

The subsequent course of events was dramatic and best shown by the following table.

	Urine Voided	
Operation at 11:30 A.M.		
6:00 P.M.	4 c.c.	July 26th
12:00 M.	150 c.c.	
2:00 A.M.	300 c.c.	
4:00 A.M.	300 c.c.	
5:00 A.M.	250 c.c.	
6:30 A.M.	150 c.c.	July 27th
7:00 A.M.	250 c.c.	
8:34 A.M.	300 c.c.	
11:30 A.M.	330 c.c.	
	2004 c.c.—in less than 24 hours	

There was profuse drainage through the wound. There was a gradual decrease in the amounts of urine at each voiding and the temperature reached normal on the 9th post-operative day. The drains were gradually shortened, removed on the 8th day following the secondary operation. However, a rubber tube of small caliber was retained in the drainage sinus. His convalescence was quite uneventful following the opening of the abscess and he was discharged on the eighteenth day after admission to the hospital. His urine at the time of leaving was entirely negative.

DISCUSSION

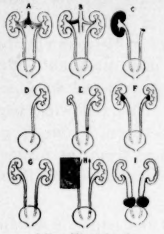
There can be no doubt that, following the classification of Eisendrath, this was a case of obstructive anuria. Speculation can be made as to whether there was obstruction of one or of both ureters. If one ureter, then the anuria was due to complete shutting off of the ureter from one kidney (the left presumably) and reflex inhibition of the kidney of the opposite side. While this manner of occurrence of complete suppression is disputed it undoubtedly does exist. Young states that "it has occurred in healthy animals following the clamping of one ureter and since many competent observers have reported its happening in cases where the opposite kidney gave every evidence of being sound, we must admit its existence, and call it, for want of a better name, reflex anuria. This reflex has not been traced".

Another manner in which the anuria might have occurred in our case was by obstruction of both ureters. This is readily conceived. The abscess was under tremendous tension, the pus being forcibly ejected from the wound. It was directly behind the bladder and could well have blocked off both ureters as they entered the pelvis.

The mechanism of these two types of obstructive anuria are shown in the diagram after Eisendrath.

Besides these two ways in which the anuria might have come about it has been suggested that the pressure of the abscess upon the bladder was greater than the secretory pressure of the urine so that in this way the secretion of urine was stopped.

The relief afforded following the release of this pressure, on one or both ureters, or on the bladder, whichever situation might have obtained, was spectacular. In less than 24 hours over 2 quarts of urine were voided. Towards the end of this period there was one specimen containing a great deal of blood, probably due to intense congestion and over-action of the kidneys.



After Eisendrath.

FIG. 335.—Diagrammatic representation of the more common forms of secretory and obstructive anuria. A, Central inhibition through nerve action on the ureter and both kidneys. B, Thrombosis or embolism unilateral (at times bilateral) checking secretion through deficient blood-supply. C, Inability of opposite kidney to function as result of disease or obstruction after removal of the other one. D, Obstruction of ureter by calculus (or renal pelvis) of a congenital solitary kidney. E, Same as D, but opposite kidney has never developed. F, Obstructive anuria due to bilateral blocking of renal pelves by calculi. G, Similar condition to F, but both ureters blocked. H, One ureter blocked by calculus and opposite kidney reflexly inhibited (reflex anuria). I, Obstructive anuria due to compression of both ureters by carcinomatous extension from uterus, rectum, etc.

Another aspect of the case, unusual in cases of anuria of even longer duration, was the absence of the so-called period of tolerance, that is, the freedom from symptoms of uremia despite total suppression. There was drowsiness and increased mental inability noted almost from the start of the suppression.

A STUDY OF 370 DEATHS OF PRIMIPARAE

BY MARY F. DE KRUIF, M.D.*

SEVERAL years ago the Massachusetts Department of Public Health made a study of 984 deaths of mothers in childbirth who were six months or more pregnant. From these records the 370 primiparae were chosen for this special study. The following paper is a summary and correlation, so far as possible, of all the data obtained from the physicians who had charge of these patients and from the hospital records.

The body of the paper is a tabulation of the main factors in their relations to one another, an analysis of each of the main causes of death, of the methods of delivery, and of other related details.

It will be noted that Caesarean section leads, though forceps deliveries have figured almost as largely, as the method used in these fatal cases among primiparae.

*For record and address of author see "This Week's Issue," page 1337.

Table No. 1 shows the main causes of death in relation to the methods of delivery.

Sepsis as a primary cause, plus the cases where sepsis was a secondary factor (as we shall show later), and the toxemias are the two principal causes of death. The sudden deaths, embolus, shock and heart trouble—78 in all—come next numerically. These are grouped in this way because in many cases the diagnosis could not be absolute without an autopsy. Hemorrhage is next in importance because it figures in a great number of additional cases as a secondary factor. Acute infections make up the group next in size. It will be seen that the septicemias and toxemias make up about two-thirds of the total. As for the method of delivery—116 were Caesareans, 106 forceps, and 88 spontaneous with the other smaller groups as shown in the table.

Most of the sepsis cases died from the fourth to the fourteenth days, as did the other acute infections. Most of the toxic cases died the first week after delivery. As for the sudden deaths, those from embolus occur later, as a rule, than those from shock or cardiac disorders.

METHOD OF DELIVERY AND CAUSE OF DEATH

Table No. 1

	Spontaneous	Low Forceps	Mid Forceps	High Forceps	Version	Caesarean Sect	Breech Extraction	Other Operative	Undelivered	Total
Puerperal Infection	25	11	8	15	6	31	4	1	0	101
Toxemia	19	4	5	11	10	38	1	1	10	99
Acute Infections	17	6	3	4	4	5	1	0	2	42
Embolism	9	7	4	4	3	12	1	1	-	41
Hemorrhage	5	3	2	2	4	6	0	0	1	23
Heart	7	5	1	2	0	8	0	0	0	23
Shock	1	1	0	5	4	1	2	0	0	14
Nephritis	-	-	-	2	-	5	-	-	1	8
Intestinal Obstruction	0	0	0	0	0	6	0	0	0	6
All Others	5	1	0	0	1	4	2	0	0	13
Total	88	38	23	45	32	116	11	3	14	370

AGE GROUP AND METHOD OF DELIVERY

Table No. 2

Age	Spontaneous	Low Forceps	Mid-Forceps	High Forceps	Version	Caesarean Section	Breech Extraction	Other Operative	Undelivered	Total
19 and under	15	3	2	1	3	5	0	1	3	33
20-24	29	13	10	18	15	26	4	2	3	120
25-29	25	10	8	10	7	42	1	0	2	105
30-34	13	7	1	9	4	22	3	0	3	62
35-39	4	5	2	7	2	14	3	0	2	39
40+	1	0	0	0	1	6	0	0	1	9
Unknown	1	0	0	0	0	1	0	0	0	2
Total	88	38	23	45	32	116	11	3	14	370

AGE GROUP AND CAUSE OF DEATH

NO. 3

Age	Puerperal Infection	Toxemia	Acute Infections	Embolism	Hemorrhage	Heart	Shock	Nephritis	Intestinal Obstruction	All Others	Total
19 & under	11	8	7	1	2	2	1		1		33
20-24	30	28	20	11	9	7	7	3		5	120
25-29	29	31	7	13	7	6	2	1	2	7	105
30-34	19	20	6	8		7	1	1			62
35-39	10	7	1	6	5	1	2	3	3	1	39
40	2	4		2			1				9
Unk.		1	1								2
Total	101	99	42	41	23	23	14	8	6	13	370

As will be shown later, in most of the cases where death occurred the first day and was called due to embolus, the diagnosis was doubtful. Hence, in the majority of deaths the sequence in time would be: (1) those due to shock, (2) those dependent on cardiac disease, (3) those caused by embolus.

In this group of cases, Caesarean section was more favorable to the baby (84 living) than any of the other operative procedures except low forceps. In the version group only 7 living babies resulted out of thirty-two.

There were 157 hospital booked, 119 hospital emergency and 80 home deliveries.

Worked out in percentages the "hospital booked" sepsis cases are slightly higher than those of home delivery. Of the "hospital emergency" cases 46% died of toxemia. Other causes of death in the home delivery cases were embolism 10, shock 2, heart trouble 2, ether 1, pernicious anemia 1, psychosis 1, food poisoning 1, dystocia 1, goiter 1. Twenty of the home delivery cases were "hospital emergency postpartum" and died in the hospital: 12 from sepsis, 3 from toxemia, 2 from hemorrhage, 1 from pernicious anemia, 1 due to psychosis, 1 from influenza.

The toxemia group leads as a cause of prematurity, the acute infections being next in importance.

Caesarean section seemed to give the babies a better chance as 84 out of 118 (2 twins) lived. Of the 11 breech extractions only two lived. The majority of the stillbirths and deaths occurred in the sepsis cases, and in the toxic cases and acute infections. There were 103, or 28% premature babies; of these only 27 lived—less than one in four. Of the stillborn and dead babies, few data are given concerning the cause aside from the factors shown in the above tables. Of the stillborn, 10 were macerated, 1 was a monster, 2 hydrocephalic, 1 died from pressure of a fibroid. Other

LENGTH OF LABOR AND METHOD OF DELIVERY

Table No. 4

Hours	Spontaneous	Low Forceps	Mid Forceps	High Forceps	Version	Caesarean Section	Breech Extraction	Other Operative	Undelivered	Total
Before Labor	0	0	0	4	1	41	0	1	14	61
1-9	43	16	9	5	9	15	2	2	0	101
10-19	17	10	8	15	7	12	3	0	0	72
20-29	5	10	3	7	4	17	2	0	0	48
30-39	3	0	2	0	2	5	0	0	0	12
40-49	2	1	1	4	2	2	2	0	0	14
50	0	0	0	2	0	6	0	0	0	8
Unknown	18	1	0	8	7	18	2	0	0	54
Total	88	38	23	45	32	116	11	3	14	370

LENGTH OF LABOR AND CAUSE OF MATERNAL DEATH

Table No. 5

	0	1-9	10-19	20-29	30-39	40-49	50+	Unk.	Total
Puerperal Infection	5	24	24	22	3	7	7	9	101
Toxemia	40	24	7	10	3	0	0	15	99
Acute Infections	2	20	7	4	1	0	0	8	42
Embolism	0	11	16	1	3	3	0	7	41
Hemorrhage	4	4	4	5	2	1	0	3	23
Heart	4	10	4	0	0	0	0	5	23
Shock	0	2	5	3	0	3	0	1	14
Nephritis	3	2	1				1	1	8
Intestinal Obstruction	2	0	2	1	0	0	0	1	6
All Others	1	4	2	2	0	0	0	4	13
Total	61	101	72	48	12	14	8	54	370

factors were a prolapsed cord, a cord about the neck four times, an arm presenting, a face presentation, and 1 was decapitated.

Of the premature babies dying after delivery there were 3 cases of convulsions, 3 of gastritis, 1 of malnutrition, 1 of dysentery, 2 of congenital syphilis, 2 of asphyxia, 1 of sepsis from hemolytic streptococcus, 1 of meningitis from abscessed ear, 1 from internal injuries, 1 from atelectasis, 1 of trismus, 1 of cerebral hemorrhage, 1 sudden death cause unknown, 1 overlaid, and 1 of spina bifida. Only one autopsy was noted, so the real cause of death was often unknown.

PRENATAL CARE—GRADED

To simplify a table of all the cases with length of prenatal care, blood pressures taken, urinalyses done regularly, pelvic measurements made, and vaginal examination during pregnancy and before time of delivery, the prenatal care was graded "A"—Good, so far as the above essentials were carried out by the physician; "B"—one or more of the above not done; "C"—no prenatal care. All cases, where the death was unrelated to prenatal care, were separated.

That is, in about one-third of the cases the cause of death was related only to delivery and post-partum factors such as tears, sepsis, post-partum hemorrhage, shock, embolus, acute dilatation of heart, etc. More detailed study will be given in relation to each group of causes.

There were 12 cases where sepsis was a secondary cause of death, the primary cause being embolus 5, toxemia 4, intestinal obstruction 1, acute dilatation of stomach 1, and in-

TIME OF DEATH IN RELATION TO CAUSE

Table No. 6

	During or at end of delivery	Few Minutes	Few Hours	12-24 Hours	2-7 Dys	8-14 Days	15-21 Days	22-30 Days	Before Deliv.	Total
Puerperal Infection	0	0	0	0	55	25	11	10	0	101
Toxemia	0	4	29	19	28	4	2	2	11	99
Acute Infections	0	0	7	1	16	11	4	1	2	42
Embolism	1	0	11	2	5	15	4	3	0	41
Hemorrhage	0	0	14	4	2	1	0	1	1	23
Heart	0	1	12	6	0	2	1	0	1	23
Shock	1	1	8	1	1	0	0	0	2	14
Nephritis				3	2		2		1	8
Intestinal Obstruction	0	0	1	1	2	0	0	2	0	6
All Others	2	1	1	0	5	2	2	0	0	13
Total	4	7	83	37	116	60	26	19	18	370

TABLE NO. 7

Time of Death in Relation to Delivery	Number of Cases
Before or at delivery	22 (14 undelivered)
1st day	127*
1st week	243*
2nd week	60
3rd week	26
4th week	19

*Does not include deaths occurring before or at delivery.

fluenza 1. Other figures on sepsis will appear under methods of delivery. The following is a typical case of puerperal sepsis:

The patient, a Lithuanian housewife, eighteen years of age. Husband owned a small grocery store. No prenatal care. Doctor engaged only, and one urinalysis made. No pelvic measurements, vaginal examination or blood pressure. Delivery at home. No nurse. Room crowded. Midforceps applied several times, after long labor. Temperature up on second day. Chill and fever on third day. Taken

FATE OF BABY AND METHOD OF DELIVERY

Table No. 8

	Spontaneous	Low Forc.	Mid-Forc.	High Forc.	Version	Caes. Sec.	Breech Extrac.	Other Oper.	Undelivered	Total
Lived	62	29	17	18	7	84	2	1	0	220
Died	10	4	3	14	4	16	2	0	0	53
Stillborn	18	5	3	14	21	18	7	2	0	88
Undelivered	0	0	0	0	0	0	0	0	14	14
Total	90	38	23	46	32	118	11	3	14	375*

*5 pair twins.

FATE OF BABY AND CAUSE OF DEATH OF MOTHER

Table No. 9

	Puerperal Infec.	Toxemia	Acute Infec.	Embolism	Hemorrhage	Heart	Shock	Nephritis	Intest. Obstr.	Others	Total
Lived	68	46	19	34	13	18	6	3	4	9	220
Died	14	15	12	3	3	1	2	2	1	0	53
Stillborn	20	30	11	4	6	4	6	2	1	4	88
Undelivered	0	10	2	0	1	0	0	1	0	0	14
Total	102	101	44	41	23	23	14	8	6	13	375

to hospital on fourth day. Temperature 106; pulse 140-105; respiration 25-45; white blood count 11,000. Flowed constantly. Heart and lungs negative. Lochia became purulent and scanty. Tender over fundus. Transfusion 300 C.C.—anaphylactic reaction. Left the hospital on the 10th day against advice of the physician. Re-entered a hospital near home. (Both very good hospitals.) Temperature 102-100-99-101.8. Respiration 30. Pulse 100-120-99. Patient's face cyanotic. Hot and moist. Bed sores on buttocks. Abdomen distended. Fundus below umbilicus. Lochia profuse and foul. Died on the 14th day. Child living and well.

FATE OF BABY AND PREMATURITY

Table No. 10

Month of Termination of Pregnancy

	9th	8th	7th	6th	Premature—month unknown	Total
Lived	193	18	9	0	0	220
Died	28	6	12	3	4	53
Stillborn	45	12	16	14	1	88*
Undelivered	6	2	3	3	0	14
Total	271	38	40	20	5	375*
				103		

*Macerated—10.

CAUSES OF PREMATURITY

Table No. 11

Cause	6th mo.	7th mo.	8th mo.	Month unknown	Total
Toxemia	9	20	24	3	56
Acute infections	3	8	7	0	18
Heart disease	1	4	5	1	11
Hemorrhage	2	3	2	1	8
Appendicitis	2	1	0	0	3
Intestinal obstruction	1	1	0	0	2
Diabetes	1	0	0	0	1
Food poisoning	1	0	0	0	1
Pyelitis	0	1	0	0	1
Fibroids	0	1	0	0	1
Psychosis	0	1	0	0	1
Total	20	40	38	5	103

Of these 86% had poor or no prenatal care. Such factors as the following enter in. In 13 cases the patient would not diet, bring urine to the doctor, or go to see her doctor, though she was warned. Twenty-six cases were seen only once by the doctor. In 30 cases the blood pressure was taken once, or not at all. In 2 cases the urine was said to be loaded with albumin

TABLE NO. 13

PRENATAL CARE

Prenatal Care			Death Unrelated to Prenatal Care
A—Good	99		78
B—Inadequate	147		38
C—None	120		15
Unknown	4		—
Total	370	Total	131

TABLE NO. 14

CAUSES OF DEATH STUDIED SEPARATELY

Sepsis and Prenatal Care

Prenatal Care			Death Unrelated to Prenatal Care
A—Good	34		32
B—Inadequate	33		10
C—None	32		8
Unknown	2		—
Total	101	Total	50*

*Cases where cause of death related to delivery only—that is, to shock, tears, hemorrhage, sepsis, etc.

TABLE NO. 15

TOXEMIA—GROUP AND PRENATAL CARE

Prenatal Care			Death Unrelated to Prenatal Care
A—Good	14		4
B—Inadequate	47		2
C—None	38		0
Total	99	Total	6

TABLE NO. 12

PLACE OF DELIVERY AS A POSSIBLE FACTOR IN THE FOUR MAIN CAUSES

Place of Delivery	Cause of Death: Sepsis No.	%	Toxemia No.	%	Acute Infections No.	%	Hemorrhage No.	%	
Hospital - booked	51	32	23	15	13	8	12	8	
Hospital-emergency	25	21	55	46	8	7	5	4	
Home deliveries	25	31	11	14	19	24	5	6	
Totals	101		96		40		22		

two weeks previous and while the doctor was away the patient became suddenly ill. Seven cases were not seen the last few weeks; 1 was a case of hydramnios where 4 gallons of fluid were drawn off.

The cases with good prenatal care were ones where the hepatic type of toxemia developed, or where post-partum eclampsia occurred, and which had not responded to diet, rest and other treatment.

In 18 other cases where toxemia was a secondary cause of death, the primary causes were: sepsis 8, hemorrhage 3, intestinal obstruction 1, embolus 2, goiter 1, heart disease 2, and post-partum pneumonia 1.

An intensive study of the several kinds of toxemia found among the total maternal deaths is to be published later by this Department. Hence further consideration of that subject will be omitted in this paper.

Hemorrhage

Of the 23 cases where hemorrhage was given as a primary cause of death 4 were ante partum, 2 intra, and 17 post partum. Prenatal care was good in 7 cases, poor in 9 cases, and there was none in 7 cases. In 11 cases the death was unrelated to prenatal care.

The most frequent causes of hemorrhage were, in order of frequency: tears, uterine inertia, premature separation of the placenta, and ruptured uterus.

In some of the ante partum hemorrhage cases there was a small passage of blood which should have warned of danger. In one case the patient "dribbled" throughout pregnancy.

An example of post partum hemorrhage:

The patient was a French woman, 25 years old, wife of an Italian truck driver. She saw the doctor two months before delivery and had a urine analysis only. Pelvic measurements were said to be normal. She was anemic, headachy and vomiting throughout pregnancy. She was in hard labor 24 hours. Anterior position; head on perineum and stopped advancing. The physician gave pituitrin. One-half hour later, after he had put on forceps, the baby was born very suddenly. The placenta was born in ten minutes and the patient began to bleed severely. The uterus was well contracted. One hour later she collapsed. This took place at home. The hospital ambulance did not arrive until two hours later. At the hospital a surgeon examined her and found a tear up through the broad ligament and through the cervix and cervical artery. He tied off the artery and the bleeding stopped. She died five hours post partum. The baby weighed ten pounds and lived.

Embolus

Of the 41 deaths classified under embolus, 12 followed Caesarean section, 15 forceps, 9 spontaneous, 3 version, and 1 breech extraction, and 1 manual. Referring to Table 6, relating to "Cause of Death and Time Elapsing After Delivery", in only two of the deaths in this group occurring within the first twenty-four hours post partum was the diagnosis, backed up by symptoms, local and general. In the other twelve there were 3 with symptoms of shock, 4 with heart failure, 3 with post partum hemorrhage, 1 with acute dilatation of the stomach, and 1 with morphine poisoning. Hence, embolus can be said to come more commonly later in the puerperium.

The following case is given as an example of embolus because it was the only one where the diagnosis was proven by autopsy:

The patient, 20 years old, wife of an assistant moving picture operator, entered the hospital in advanced first stage of labor. She had had some prenatal care at the clinic and examinations made at the hospital, and seemed normal in every way. She was in labor four hours in the hospital. The membranes ruptured and the head promptly appeared on the perineum. She was unco-öperative and when given obstetrical anaesthesia became uncontrollable. Then she was fully anaesthetized and delivered easily with low forceps. No abdominal bleeding; fundus contracted well. On the tenth day she was allowed up to go to the bathroom but fainted in the nurse's arms. A physician was called and found the pulse rapid, the lips and nails blue, and the face very pale. Morphine was given in two doses. After fifteen minutes she started to breathe very rapidly. Heart was found normal. She became restless and died in a short time. At autopsy performed one hour later, a large embolus was found in both pulmonary arteries.

Shock

All were after long labor. The method of delivery in these cases was as follows:

6 forceps
2 breech extractions (2 badly torn)
4 version (3 with craniotomy)
1 spontaneous (followed by inversion of uterus)
1 Caesarean section (died on the seventh day, had symptoms of sepsis and was also syphilitic—probably was not a case of shock)

Prenatal Care—4 good, 8 poor, 2 none—14.

6 no pelvic measurements nor vaginal examination
3 pelvic measurements and no vaginal examination
6 both pelvic measurements and vaginal examination

Few symptoms are given; the women died at or shortly after delivery, some of them, no doubt, with ruptured uterus as the cause.

Example of a shock case: Mrs. C., an American, 22 years old, wife of a truck driver. Prenatal care throughout; urine examined and blood pressure taken only,—how often not stated. Hospital—booked. In labor two days. Presentation right-occipito-posterior. "Her pains did not seem to be of the right kind." She began vomiting. The doctor put on high forceps and she went "suddenly bad". He stopped for a while and then had to finish delivery. She died before the baby was born. It was a still-born, male, weighing 10½ pounds. Surgical shock was the cause given.

Cardiac Cases

There were 23 cardiac deaths. See Tables 1 and 6 for method of delivery and time elapsing before death. Most of these died late in the first day or within a few days—not as soon as the shock cases and not as late as the embolus cases. In three cases there was no history of previous heart trouble, two being possible embolism and one shock. Of the other 20, 1 was acute myocarditis and 19 had a history of chronic heart trouble; 13 were mitral lesions dating to previous rheumatism, children's diseases and pneumonia; 1 chronic myocarditis which dated to influenza four years before. Another was not diagnosed ante-partum but the patient had all the symptoms and was found to have an enlarged heart at the hospital. One had congenital heart disease, one a "heart murmur", and another a valvular endocarditis from tonsillitis two years previous. Seven had good prenatal care, 11 poor, and 5 none. There were 6 cases with heart trouble as a secondary cause of death: 4 mitral lesions, 2 acute toxic myocarditis.

Acute Infections

Forty-two cases. Of these 42 cases of acute infection complicating pregnancy there were:

16 ante partum pneumonia
12 post partum pneumonia
6 tuberculosis with acute exacerbation or an acute pneumonia
2 erysipelas
3 influenza
1 tonsillitis
2 scarlet fever

Ten had good prenatal care, 11 poor, 17 none, and 4 unknown. In seventeen cases the death was unrelated to the prenatal care. There were 20 cases with acute infection as a secondary cause of death.

Primary Cause	*Secondary Cause*
2 heart disease	Broncho pneumonia
1 sepsis—streptococcus	Pneumonia
1 sepsis	Erysipelas and mumps
7 sepsis	Scarlet fever
1 toxemia	General tuberculosis
2 embolus	Pneumonia
5 toxemia	Influenza
1 post partum hemorrhage	Bronchitis

Intestinal Obstruction

Six primary and 2 secondary. In every case where intestinal obstruction was the primary cause of death delivery was by Caesarean section. One was a case of ante partum obstruction, due to a fibroid; colostomy performed at delivery. In another case the Caesarean section was performed on account of eclampsia; multiple fibroids were noted. The obstruction occurred post partum. Three cases came on after Caesareans, where there were adhesions from an old appendix operation, one with previous uterine suspension. One followed a Caesarean section for contracted pelvis. In this and two others there were some symptoms of sepsis. One proved to have a subphrenic abscess at autopsy. In the two cases where intestinal obstruction was given as a secondary cause of death, 1 was a case of generalized tuberculosis, an enterostomy being necessary post partum. The other was a case of sepsis and fibroid with an operation post partum.

Acute Dilatation of the Stomach

Three cases, all following Caesareans. In one the incision was opened on the third day and a tube inserted into the bowel to release gas. In a second it was complicated with pneumonia. In the third there had been an old suspension and appendix operation with adhesions. There was sepsis in this case.

Operative Procedures

For main correlations, causes of death, etc., see Tables 1, 2, 4, and 6.

Forceps

One hundred and six cases. Seventy-three had no vaginal examinations before the time of delivery. Sixty had no pelvic measurements before the time of delivery. Some of those, said to be normal, were only estimated.

Indications for forceps

Long labor	32
Toxemia	22
Posterior position	12
Not given	12
Uterine inertia	8
Heart trouble	5
Pneumonia	4
Exhaustion	3
Hemorrhage	2
Face presentation	1
Head not engaged	1
Contracted pelvis	1
Lack of co-öperation	1
Obesity	1
Large baby	1
Total	106

Twelve had no previous pelvic measurements or vaginal examinations. Four had both of these. Four had pelvic measurements but no vaginal examination.

Versions

32 cases

Indications

Eclampsia	10
Abnormal position	4
Hemorrhage	3
Contracted pelvis	3
Long labor	2
Diabetes	1
Breech presentation and ruptured uterus	1
Contracting ring	1
Pyelitis and vomiting	1
Twins	1
Tumor	1
Unknown	4
Total	32

Sixteen had no previous pelvic measurements or vaginal examinations; 9 had both; 7 had pelvic measurements but no vaginal examination.

Craniotomy was performed in 3 cases. In 11 cases forceps were tried before version was performed.

Caesarean Sections

One hundred and sixteen cases. Only 26 of these were operations of choice and not done as an emergency measure. In 41 there was no labor, in 15 short labor, and in 42 ten hours or over. Of the last mentioned 23 died of sepsis, the other 19 of these dying from the following causes:

Toxemia	4
Embolus	5
Hemorrhage	3
Intestinal obstruction	3
Shock	1
Bronchial pneumonia	1
Dilatation of stomach	1
Heart disease	1
Total	19

In 18 cases the length of labor was unknown. Only 52 had pelvic measurements before the time of delivery and in one of these, external only. 34 had vaginal examinations previous to labor; 39 had one or more vaginals at delivery, 23 of these becoming septic.

Indications for Caesarean Section

Toxemia	43
Lack of progress	22
Contracted pelvis	15
Heart trouble	10
Hemorrhage	8
Abnormal presentation	7
Fibroids	2
After forceps attempt	2
Vomiting of blood and round worm	1
Obesity	1
Elderly mother and baby hydrocephalic	1
Intestinal obstruction	1
Request of patient	1
To get head (decapitation in footling case)	1
Unknown	1
Total	116

Example of Caesarean Case: The patient was born in Ireland, age 27, wife of a railroad mail clerk. Prenatal care eight months; eight blood pressures and urine analyses, but no previous vaginal or pelvic measurements, which were found to be narrow. Hospital—booked. Expected normal confinement. Labor 4 days. Pains severe first night but moderate after that. Unable to determine whether child was alive. Patient's general condition good except she became apprehensive and flighty. Condition worse by 4th day. Patient short and stout. Cervix rigid, narrow; no dilatation whatever. Was examined four

TABLE NO. 16

CAUSE OF DEATH AND METHOD OF DELIVERY

Cause of Death	Spontaneous	Forceps	Version	Caesarean Section	Manual	Undelivered	Totals
Sepsis	3	2	—	1	—	—	6
Toxemia	2	4	0	3	1	2	12
Embolus	—	2	—	—	—	—	2
Acute infections	5	1	2	—	—	—	8
Heart	—	—	—	1	—	—	1
Others	1	—	—	—	—	—	1
Totals	11	9	2	5	1	2	30

Age Groups

19 years and under	9
20-24	9
25-29	6
30-34	4
35-39	1
40 and over	1
Total	30

Place of Delivery

Hospital—booked	7
Hospital—emergency	14
At home	7
Undelivered	2
Total	30

Fate of Baby

Living	17
Stillborn	7
Dead	4
Undelivered	2
Total	30

or five times by doctors and nurses but no attempt to dilate cervix. Caesarean section on that day (fourth); found head wedged in pelvis, which was too narrow for possible delivery of the child. Placenta already separated and was partly gangrenous, as was neighboring uterine wall. Peritoneum flooded with gangrenous detritis. Peritonitis set in. She died on the fourth day. The baby was stillborn.

Undelivered

The undelivered cases were 14 in number—10 toxemias, 1 hemorrhage, 1 nephritis and 2 acute infections. Two died at home, one attended by a midwife until the patient was dying in convulsions. Nine were hospital emergencies. Five had poor prenatal care and 9 had none.

OTHER FACTORS

PRENATAL CARE

None	20
Saw doctor once	2
2 weeks at hospital	2
1 month	2
2 months	2
3 months	2
Total	30

1. *Illegitimacy—30 cases*

2. *Change of Physicians*

3. *Midwives*

Midwives had a hand in 12 cases. The causes of death were as follows:

Sepsis	6
Hemorrhage	2
Toxemia	1
Pernicious anemia	1
Pneumonia	1
Ether overdose	1
Total	12

4. *Abnormal Position of the Baby*

Right occiput posterior	16
Left occiput posterior	2
Breech presentation	18
Face presentation	3
Brow presentation	1
Arm presentation	1
Transverse	2
Footling	1
Total	44

In most cases the position was not given. Of the babies themselves 9 were said to be macerated, 2 hydrocephalic, 1 monster. Large babies were noted in some cases.

5. *Certain Surgical Complications* were noted as follows:

Tears—1st degree	9
*2nd degree	31
†3rd degree	9
Adherent placenta	8
Retained placenta or membranes	7
Inverted uterus	2
‡Ruptured uterus	3
Episiotomy	5
Phlebitis	13
Pelvic abscess	6
Curetted, post partum	3
Ruptured bladder	1
§Appendix operation	3
To replace omentum	1
To replace uterine sutures	1
Enterectomy	2
Colostomy	1
Hysterectomy	1
Resecting tubes to sterilize	2

*6 deep cervical.
†Into rectum.
‡Suspected in three others.
§2 at 3rd month—1 operated for adhesions later causing premature birth; 1 at delivery ruptured; ? of another.

This is valuable in that it gives some information in regard to causes of sepsis, post partum hemorrhage, shock, embolus, etc.

6. *Hospital Epidemics*

Five of these deaths were said to be one of a *group* of hospital infections.

7. *Fibroids*

In 16 cases fibroids were noted—8 were diagnosed ante partum.

As for Prenatal Care
- 6 had both pelvic measurements and vaginal examination
- 6 had neither
- 2 had vaginal examinations only
- 1 pelvic measurements only
- 1 external pelvic measurements only

Prenatal Care
- 4 good
- 10 inadequate
- 2 none

Length of Labor
- 4 none
- 3 short
- 8 long
- 1 unknown

Method of Delivery
- 11 Caesarean section
- 2 forceps
- 2 forceps and version
- 1 spontaneous

Cause of Death
- 5 sepsis
- 3 toxemia
- 2 embolus
- 2 intestinal obstruction
- 1 heart trouble
- 1 shock
- 1 bronchial pneumonia
- 1 hemorrhage

The ways in which fibroids complicated delivery were as follows:

CASE 1. Elderly primipara—manual attempted after short labor, because of toxemia but perineum "tore like paper", hence, a Caesarean section and removal of fibroid kidney. Died of nephritic toxemia.

CASE 2. Aged primipara. No labor. Head high and no engagement. Caesarean section. 3 fibroids

adherent to gut and omentum and low in uterine wall preventing engagement of head. Removed. One necrotic. Fibromyomata. Died of sepsis.

CASE 3. At removal of small fibroid of vagina, on 15th day post partum, patient died of embolism.

CASE 4. Caesarean section because of uterine fibroid and heart murmur. Died in one hour—heart trouble.

CASE 5. No prenatal care. Premature separation of placenta. 10 hours labor—hard. Low forceps. Baby macerated from pressure of large sloughing fibroid. Ante and post partum hemorrhage. Sepsis.

CASE 6. The large tumor was diagnosed as the head of a twin. Long labor. Delivery by forceps and version. Baby stillborn. Intestinal obstruction—operated 3rd day post partum. Died of sepsis.

CASE 7. Operated at third month for appendicitis and one tumor removed. One in posterior uterine wall low down—not removed. Labor three days. Tranverse position. Fibroid blocking exit. Caesarean section. Placenta adherent to fundus. Baby stillborn. Mother died of sepsis.

CASE 8. Long labor. Head high and right occiput posterior. Little bleeding. High forceps, and version. Cause of death—shock. (Fibroids found at autopsy.)

CASE 9. Sent in by local physician with no letter. Long labor. Spontaneous delivery. Multiple fibroids, enlarged during pregnancy. Hemorrhage from retained placenta. Died of embolus on 9th day.

CASE 10. Contracted pelvis. Long labor. Placenta praevia. Uterus refused to function. Caesarean section. Large fibroid found. Died of pneumonia.

CASE 11. Caesarean section late in labor on account of eclampsia. Many fibroids found. Died of intestinal obstruction.

CASE 12. Caesarean section for eclampsia. Family doctor away. Fibroids not diagnosed before operation. Uterus full of fibroids. Died of eclampsia.

CASE 13. External pelvic measurements only. Large promontory of sacrum and many fibroids,—not diagnosed 6 hours labor. Footling. Caesarean section for retained head after decapitation. Died of sepsis.

CASE 14. Caesarean section on account of high blood pressure. Found a fibroid uterus. Removed one fibroid the size of baseball. Not diagnosed ante partum. Died of eclampsia.

CASE 15. Large fibroid to right of fundus—(diagnosed by abdominal examination)—which caused intestinal obstruction. Caesarean Section. Colostomy. Bowel necrotic. Died same day. Intestinal obstruction.

CASE 16. Caesarean section was done because of severe ante partum hemorrhage, due to a separated placenta. Uterus found full of fibroids—not diagnosed before because of no pelvic and no vaginal examinations. Died of hemorrhage.

These cases seem to show that fibroids are apt to grow rapidly during pregnancy and are apt to become necrotic. They may obstruct the birth canal, or cause hemorrhage, intestinal obstruction, or sepsis. Six of the babies were stillborn and two died in a short time.

8. *Psychosis of Pregnancy*

Of the 6 cases of psychosis, 5 were in elderly primiparae and 1 in a young illegitimate. Four were associated with nephritis, 1 with heart disease, and 1 with sepsis and a possible lues.

9. *Gonorrhea and Syphilis*

There were 12 cases where these infections were proven or suspected. One had a positive Wassermann and tubal abscess and was under treatment. Two others had both diseases but were not being treated. Of the other 9, 4 were merely suspected.

10. *Laboratory Examinations other than Urine Examination*

Wassermann examinations noted	25	1 positive
Smears	11	
Blood cultures	7	
Blood counts	21	
Autopsies	8	
Vaccines given	2	

These were all that were mentioned in the 370 histories.

SUMMARY AND CONCLUSIONS

1. Septicemia, toxemia and hemorrhage, causes generally conceded to be largely preventable, were responsible for 60% of these deaths and were secondary factors in many others.

2. Seventy-two per cent. of deaths of primiparae were operative cases, whereas among the 614 multiparae studied 53% were operative.

3. Lack of adequate prenatal care was evident in 73% of the cases. One-third had no prenatal care whatever. Also in about one-third of the cases the cause of death had little or no relation to the prenatal care but was dependent upon delivery or postnatal factors.

4. In primiparae Caesarean section resulted in living babies in 71% of the cases, a much higher percentage than was the case of high and mid forceps, version and breech extraction. Toxemias and acute infections are in this study most frequently associated with causes of stillbirths and early deaths of infants. Of 103 premature terminations of pregnancy only 27 babies lived; that is, less than one in four. Toxemias caused 54% of the prematurities. Acute infections, heart disease, and hemorrhage were the other chief causes.

5. The outstanding features in the main causes were:—First, sepsis—a slightly higher percentage of sepsis occurred among the hospital booked cases than among the home deliveries. Second—toxemias—86% had poor or no prenatal care. Almost half the hospital emergency cases were toxemia cases. The importance of hemorrhage stands out when we find, in addition to 23 cases with hemorrhage as the primary cause of death, 52 with hemorrhage as a secondary factor—37 of these post partum and 21 dying of sepsis. Of the sudden deaths the majority of embolus and shock cases followed operative procedure. Cardiac disease plays a more important part than was formerly supposed, occurring in 6.2% of the primiparae and 7% of the multiparae studied, in most cases dating to previous acute infections.

6. The outstanding features of the operative cases are that 50 to 60% had no previous pelvic measurements taken or vaginal or abdominal examination. The majority of the Caesareans were emergency measures with no pelvic measurements, and many after long labor and many vaginal examinations during labor.

7. Lack of prenatal care is the most important factor in the deaths of illegitimate cases, with toxemia the main cause of death.

8. Midwives were mentioned in only 12 cases.

9. The 16 cases of fibroids show that they do cause serious complications in pregnancy, and at delivery cause hemorrhage, dystocia requiring surgical interference, etc. Proper pelvic or abdominal examinations must be made to recognize these in time to prevent trouble at delivery.

PAROXYSMAL HEADACHE II

Observations on the Etiology, Symptomatology, and Treatment of the Migrainous State*

BY C. W. MC CLURE, M.D.,† AND MILDRED E. HUNTSINGER, B.S.†

THE present report outlines the progress of observations on the etiology, symptomatology, and treatment of clinical entities included under the term migraine. This term is used to designate an affection characterized by paroxysmal attacks of headache, commonly associated with nausea and vomiting, and not infrequently by some sensory disturbance, especially visual. It is the condition known among the laity as blind headache, bilious headache or sick headache. The present study includes three types of migraine. One type is that in which the headache is the predominating symptom. In the other two types the headache is either slight or its discomfiture is overshadowed by the severity of attacks of abdominal pain or by attacks of nausea and vomiting. It is upon these latter types of patients that even surgeons of experience may be influenced to operate. Such operations entail the loss of the various surgically removable body parts situated in the regions lying anywhere between the uterus inferiorly and the walls of the nasal sinuses superiorly. Only too often the results of such therapy vary in character from merely the production of the toothless grin to the implantation in an already overburdened, hypersensitive nervous system of a pitiably hopeless psychoneurotic complex.

Regarding the pathology of migraine, "no anatomical changes are known. We have still to admit that the nature of the disease is uncertain, although there have been and are many theories"[1]. These have been summarized by Rupert and Wilson[2]. The hypothetical state of the pathogenesis of migraine cannot be better emphasized than to call attention to publications by Wilkie[3] and Higgins[4]. In these articles it is argued that duodenal ileus is the cause of migraine. But, "the almost universally accepted view is that migraine is due to disturbed function of some part of the brain"[1]. On the other hand, Vallery-Radot[5] in France, and Miller[6] in this country are prominent advocates of the concept that migraine is an expression of that form of toxemia designated immunologically as anaphylaxis. Experimental observations supporting a toxic pathogenesis of migraine were reported by van Leeuween, Storm and Zeydner[7]. The findings of these investigators suggested the presence of an undetermined type of toxin in the blood of migrainous patients. Other and more definite evidence of toxemia was pointed out by McClure and Huntsinger[8]. Such evidence consisted of the demonstration in migrainous subjects of liver functional disturbance and of cutaneous reactions to the proteins of foods. These findings led to the conception that migrainous manifestations were expressions of hepatic dysfunctions, the latter resulting from underlying toxic conditions. Protein poisoning was advanced as one of the possible underlying factors. The authors' experimental results were soon verified by those of two independent investigators. Vaughan[9] confirmed the occurrence of cutaneous food protein reactions. Using the van der Bergh technique, Diamond[10] verified the presence of hepatic dysfunction in migraine. The presence of hyperbilirubinemia had been demonstrated as early as 1923 by Hetényi[11]. In addition to these observations McClure and Huntsinger have shown well marked disturbances in the lipid metabolism of migrainous patients[12]. These are the first definitely pathologic findings demonstrated in migraine.

For purposes of the present study it was essential that the symptomatology presented by the patient be so typical that no reasonable doubt could exist concerning the accuracy of the diagnosis. A second essential of equal importance was that the patients be capable of making intelligent observations of their progress and be fully co-öperative. The first essential required the customary thorough clinical study and special examinations as indicated. Such special examinations included various types of radiography, ophthalmoscopic observations, plot-

*From the Gastrointestinal Division of the Evans Memorial and the Surgical Service of the Massachusetts Homeopathic Hospital.

†For record and address of author see "This Week's Issue," page 1337.

ting the visual fields, basal metabolism and other examinations relating to the endocrine system, neurological studies, etc. The second essential required prolonged observation of the individual patient. Such observation has led the authors to feel justified in reporting the findings in but 78 of the patients studied. Of these, 17 were males and 61 females. Their ages, the age at onset of migraine, and its duration in years have been tabulated.

TABLE I

AGE OF PATIENT, AGE AT ONSET AND DURATION OF MIGRAINE IN YEARS

Age of patient		Age at onset of migraine		Duration of migraine	
Years	No. patients	Years	No. patients	Years	No. patients
18-20	2	1-10	41	1-10	10
21-30	12	11-15	13	11-20	16
31-40	24	16-20	11	21-30	25
41-50	22	21-30	9	31-40	15
51-60	12	31-40	4	41-50	8
61-70	6			51-60	4

The tabulated figures show that 65 of the 78 patients developed migraine before the third decade. More than half of the cases persisted after the fourth decade, and 63 of the patients had been suffering from 10 to 40 years when first examined. The frequency of the occurrence of the headache varied considerably. In the majority it developed from intervals of every 24 hours to as long as several weeks. Its usual duration was also variable, the minimum attack persisting a few hours and the maximum a week. The character of the headache described by the 78 patients included every known type. Unilateral headache (hemicrania) and sensory prodomata were described by only an occasional patient. Nausea and vomiting accompanied the headache in 25 patients and was absent in 53.

Attacks of nausea and vomiting unaccompanied by headache had been prominently present in 2 patients from early childhood up to the age of puberty. At puberty such attacks ceased but were replaced by the usual paroxysmal headache of migraine. The headache was accompanied by epigastric pain of varying severity in one of the subjects and by mild vertigo in the other. Attacks of nausea and vomiting were symptoms harassing 4 other patients, in 3 of whom the accompanying headache was of mild severity. In three of these patients the Graham x-ray procedure showed no evidence of gall bladder disease; in the fourth the gall bladder did not fill with the dye. Barium studies showed no gastro-intestinal lesions in any of these 6 patients. These patients are representative of a group in which the migrainous symptoms of nausea and vomiting overshadow the headache.

Six patients had undergone cholecystectomy because of the frequency and severity of attacks of pain resembling biliary colic. In 4 of these patients chronic cholecystitis was found, in 3 of whom it was complicated with stones. However, in only one of them was the abdominal pain relieved by the operation. Indeed, in one patient the attacks resembling bliary colic were more frequent and more severely painful following the removal of a gall bladder containing stones. No disease of the gall bladder was demonstrable in the other 2 patients, although this organ was excised from one and examined histologically. Headache, which was a prominent symptom in all these patients, was unaffected by the operative procedure. Attacks of pain resembling gall stone colic occurred in 17 other patients, in whom the headache varied from mild to severe. None of them showed x-ray evidences of disease of the gall bladder by the Graham procedure, nor were gastro-intestinal lesions demonstrated by barium studies. They all showed disturbance in the state of liver function. It is these types of patients in whom the migrainous condition is often not recognized and on whom surgical procedures are apt to prove unsuccessful.

The oral Graham procedure was applied to 72 of the 73 patients who had not been subjected to operations on the gall bladder. By this means in 10 patients the presence of gall stones was definitely demonstrated, in 6 the gall bladder was not visualized, while in 4 chronic cholecystitis was found on laparotomy, making a total of 20 patients in whom the diagnosis of chronic cholecystitis was made. Of these patients only 10 complained of biliary colic. The prevalence of gall bladder disease in migraine had been previously observed by McClure and Huntsinger[8] and by Kelling[13]. In the present investigation 45 per cent. of patients over 40 years gave well marked evidence of the presence of chronic cholecystitis. Barium x-ray gastro-intestinal examinations were made in 65 of the 78 patients. Seven of these described symptoms typical of ulcer, and characteristic duodenal deformities were found on x-ray examinations. If duodenal ulcer actually existed, then its incidence in this series of patients was 9 per cent. The duodenum was distorted in 4 other patients and was interpreted as the result of adhesions. Fifty-four patients showed no organic gastro-intestinal lesions by x-ray examinations. However, the atonic or ptosed type of stomach was present fairly often, while the evidences of so-called duodenal ileus were occasionally demonstrable.

Determination of the state of liver function by means of analysis of duodenal bile[14] was carried out in 72 of the patients and in 65 showed the presence of hepatic dysfunction. The frequency of disturbance in the state of liver function, thus demonstrated, confirms the correctness of earlier findings[8].

Cutaneous protein sensitization tests, done by

the scratch method, were performed on 37 of the patients. Ten of these showed positive reaction as follows: two patients reacted to casein and two others to lactalbumin of cow's milk, one reacted to egg white and to chicken feathers, one to wheat globulin and ragweed, one to cauliflower, one to egg white, parsnip and wheat globulin, one to lamb and one to rice. These findings confirm previous observations[8, 9] on the occurrence of such reactions in migrainous subjects.

So many secondary factors may influence the progress of chronically recurring headache that it is frequently difficult to establish the status of a given therapeutic measure. In order to arrive at correct interpretations all patients treated during the present investigation have been excluded in whom any secondary factors may conceivably have participated in producing favorable results. This leaves but 33 patients on whom the effect of a particular type of treatment could be accurately determined.

Twenty-nine patients were treated by intraduodenal therapy only. Such treatment consisted of the intraduodenal introduction of 30 cc. of 33 per cent. magnesium sulphate solution through a tube, at weekly intervals. Extensive investigations on both the lower animals and man have established the pharmacological[15] and therapeutic[16] action of magnesium sulphate on the liver. These investigations showed that magnesium sulphate is not only a biliary stimulant but that it may exert such pharmacodynamic action on functionally disturbed liver cells as to return them to a state of dynamic equilibrium. This result can, however, only be obtained when magnesium sulphate reaches the liver in the proper degree of concentration. In man this can be usually accomplished by placing the magnesium sulphate solution directly in the intestines through a tube.

Of the 29 patients treated by intraduodenal therapy 18 were relieved, 6 improved and 5 unimproved. Thirteen of the 18 patients relieved have been followed over periods varying from 3 months to a year. The remaining 5 patients have been kept free from symptoms over periods varying from 1½ to 4 years by the following method of procedure. The initial treatment of these 5 patients was continued until the maximum improvement in the symptoms and in hepatic function were obtained. The latter was determined through analysis of duodenal bile by procedures and methods previously described[14]. After maximum improvement had been obtained, the treatment was stopped for three months. The patient was then re-examined and the state of liver function again determined. The patient was given a short course of treatments if no relapse in either symptoms or hepatic function had occurred, after which he was discharged for 6 months. On the other hand, if relapse in symptoms or the state of liver function had developed, treatments were continued until maximum improvement had again been obtained. The patient was then again discharged for a period of three months.

The number of intraduodenal treatments necessary to produce improvement in the migrainous symptoms varied from two to a large number. Usually, however, improvement began not later than the fourth treatment. On the other hand, maximum relief from migraine required usually another month; as did, also, the maximum improvement in the state of liver function. It is important to record that the state of liver function, as shown by analysis of the duodenal bile, became much more nearly normal in those patients whose symptoms were relieved than in those who experienced partial relief only. No improvement in the state of liver function was found in those patients who received no benefit from the intraduodenal therapy. These findings confirm those of an earlier investigation[8].

One woman, age 60, had suffered with severe migrainous attacks since childhood. Before beginning treatment the attacks of migraine had confined her to bed 5 days each week over a period of 2 years. The attacks were so severe that the free use of morphine produced but little relief. After 10 months of intraduodenal treatment she became almost free from symptoms. The next 6 months were spent touring Europe. Then a mild migraine developed once a week and she soon recommenced intraduodenal therapy, but the attacks grew progressively worse. For several months they remained about one half as severe as those occurring before the initial treatments were commenced. However, during the few days a week in which there was freedom from symptoms the patient exhausted herself through over-exertion. Due to this and the persistent vomiting during the migrainous attacks the patient was in a state of relative starvation. As a result she became much undernourished and this condition was considered a factor potently influencing continuance of the migrainous attacks. For this reason the food intake was greatly augmented with most satisfactory influence on the migraine. The importance of adequate nutrition in the treatment of migraine is further illustrated by the progress of three other patients. These three patients presented themselves in an emaciated and greatly weakened physical state due to prolonged undernutrition. "Forced feeding" eventually greatly relieved the migrainous symptoms. The degree of relief from symptoms experienced was in direct proportion to the gain in weight and strength obtained.

One patient was a girl of 27. Since "early childhood" she had suffered with severe headache accompanied by pain resembling gall stone colic. The patient showed a positive cutaneous reaction to the casein of cow's milk. When given a diet containing much cow's milk, the symp-

toms were greatly aggravated. When cow's milk was replaced by goat's milk, she made a splendid recovery. During a period of 2 years the patient has remained free from symptoms except when she would try the use of cow's milk. This is the only patient from whom the withdrawal of proteins to which positive skin reactions were obtained apparently exerted an influence on the symptomatology.

Ten patients complaining of pain simulating that of peptic ulcer or of gall stone colic, and in whom the x-ray evidences of either condition were missing, received the bland type of diet commonly given to patients with peptic ulcer. Nine of them became quickly free from pain while taking the diet. The 10th patient received no relief from dieting, although intraduodenal therapy relieved the paroxysmal headache.

Two of the patients who were not relieved from abdominal pain after cholecystectomy for definite gall bladder disease received intraduodenal treatments. During this treatment one was completely relieved from the attacks of abdominal pain. After the operation the other patient had continued to have headaches and attacks of gall stone colic with accompanying chills, fever and jaundice. Such attacks occurred every two or three weeks. Following intraduodenal therapy the intervals between these attacks were finally lengthened to 6 to 8 months. The headaches of both patients disappeared during the treatment. The relief experienced by these two patients is interpreted as the result of improvement in the state of liver function, which was reflected by favorable changes in the character of the duodenal bile analysis.

DISCUSSION

Expressed in percentages, the figures in Table 1 show that the paroxysmal headache developed before the age of puberty in approximately 52 per cent. of the patients, after it in about 31 per cent., and at that age in only 17 per cent. These findings suggest that the onset of migraine at periods other than adolescence is much more common than is usually recognized. The figures above show, further, that the headaches recurred over periods of 20 to 40 years in approximately 71 per cent. of the patients. Such chronicity emphasizes both the great amount of suffering which the migrainous state commonly causes and the importance of its study as a medical problem.

The frequency of the headache unaccompanied by sensory or other phenomena demonstrates that "the essential and often the only symptom (of migraine) is paroxysmal headache"[1]. Unilateral headache (hemicrania) was so infrequently found as to confirm the statement that it is "by no means always"[1] present. The infrequency of hemicrania may possibly explain why the majority of the 78 patients studied had not been previously diagnosed as migrainous. The uncommoness of the diagnosis emphasizes the importance of the statement of Mackintosh and Anderson[1] that "migraine is a much more common affection than is usually supposed."

Groups of migrainous patients have been described in whom the headache was overshadowed by symptoms of intra-abdominal lesions. Nevertheless, such lesions were not usually demonstrable. The findings in these groups are comparable to those described by Blitzsten and Brams[17], and by Buchanan[18]. In an attempt to relieve the symptoms laparotomy had been performed for so-called chronic appendicitis on 7 patients, hysterectomy on 3, oöphorectomy on 1, and cholecystectomy on 5. Seven other patients had undergone various operations on the nose and nasal sinuses and tonsils. All these operations were singularly unsuccessful in relieving either the headache or the abdominal symptoms. Such results are comparable to those observed by Buchanan[19]. In all these patients liver funetional disturbance was demonstrated, and, as will be discussed later, its treatment was accompanied by clinical improvement. Such observations are interpreted as showing that the symptoms were largely dependent upon the liver's functional state.

So-called duodenal ileus is an x-ray diagnosis. It is made when antiperistalsis accompanies stoppage of barium in the region of the junction of the second and third portions of the duodenum. Such phenomena are usually produced by one of two conditions. One is true organic obstruction of the duodenum, and the other hypersensitivity of the bowel. In the presence of the latter antiperistalsis may be more apparent than real because the forceful contraction of the gut on a central bolus of barium causes a portion of it to progress proximally as well as distally[12, 20, 21]. The temporary sojourn of barium in that particular region of the duodenum is a normal phenomenon ordinarily explained on a well known anatomical basis. The constitution of an abnormality by difference in time is not always easy to establish. In any event these phenomena are not uncommonly demonstrable in migrainous subjects. They are also found in the presence of a variety of conditions[22] which render the gastro-intestinal tract hypersensitive to stimuli. In the present series of patients 21 complained of dyspepsia, 17 of pain simulating gall stone colic, 6 of attacks of nausea and vomiting and 7 gave symptoms of duodenal ulcer. In 20 chronic cholecystitis was demonstrated. Thus in 71 of the 78 patients abnormal gastro-intestinal conditions existed. Therefore, in migrainous subjects the gastro-intestinal tract is frequently hypersensitive to stimuli. Because of this hypersensitivity the occurrence of so-called duodenal ileus in migrainous patients is to be anticipated. Furthermore, the varied conditions with which

so-called duodenal ileus is associated are usually not characterized by headache. On the basis of these findings, and in the absence of organic obstruction, it is concluded that so-called duodenal ileus is a result of an accompanying hypersensitive gastro-intestinal tract rather than a cause of migraine.

It is well known that headache is a symptom resulting from even more diverse causes than pyrexia. Among these causes are a variety of gastro-intestinal conditions. Therefore, in the presence of duodenal obstruction headache may be expected. However, true organic duodenal obstruction is infinitely less frequent than the occurrence of paroxysmal headache. For this reason it can only be considered as an unusual cause for headache. As such its correction through duodenojejunostomy relieves the headache. On the other hand, in the absence of organic obstruction the headache is not relieved by this operation[3]. Failure is to be anticipated in view of the findings discussed in the preceding paragraph.

The protein sensitization tests were performed strictly according to the technical procedure developed by Walker[23]. Under such experimental conditions both the clinical and pathologic significance of positive reactions have been established for hay fever and for asthma. An important part of this work was the production of these diseases by administration of a protein to which the patient reacted, and the relief from symptoms after withdrawal of the protein or after producing immunity to it. Only one of the 10 migrainous patients reacting to protein showed symptoms on administration of the reacting proteins and relief after its withdrawal. This patient has been described as showing a positive cutaneous test to the casein of cow's milk. But there are a variety of ways, entirely foreign to anaphylaxis, by which foods may cause gastro-intestinal symptoms, including abdominal pain. Also several gastro-intestinal conditions, which temporarily or permanently affect the food intake, are not uncommonly accompanied by severe headache. Such headaches are frequently relieved when conditions are produced which permit proper nourishment. Therefore, relief experienced by the one patient after withdrawal of cow's milk did not prove that the headache was the result of an anaphylactic reaction, or indeed, of any type of toxemia.

Another factor of paramount importance in deciding whether a disease entity is of anaphylactic origin relates to the technic employed in performing the cutaneous tests. Both the technic and the character of the positive reaction described originally by Walker[23] have been subjected to profound modifications by many observers. Such modifications include the intracutaneous method, interpretating as significant "delayed" reactions and those reactions described by Walker as doubtful. The clinical and pathologic significance of such modifications will remain uncertain until the status of each has been established through extensive investigations comparable to those made originally by Walker[23]. Until that time the use of such modifications can only lead to confusion.

From the above discussion it is obvious that whether the occurrence of positive cutaneous food protein reactions places migraine in the category of anaphylactic conditions is open to question. But the fact that such reactions occur is highly suggestive of some causal connection. One such possible connection was stated in a previous communication[8], which was that food protein may be a toxic factor disturbing the state of liver function. When once deranged, apparently the liver's functional condition is not prone to return spontaneously to a state of dynamic equilibrium even after the withdrawal of the disturbing factor[12]. This observation offers an explanation for the usual failure to obtain relief after withdrawal of reacting proteins in the present series of migrainous patients.

Liver functional disturbance was demonstrated in 90 per cent. of the 72 patients examined. Relief from, or improvement in, the headache was obtained in 79 per cent. of 29 patients by treating the disturbed liver functional state. Furthermore, abnormalities in lipid metabolism occur in migraine which are comparable to those demonstrated in affections of the liver[12]. These observations indicate that the liver plays an important rôle in the production of migrainous symptoms.

The occurrence of positive cutaneous protein reactions, the frequent incidence of demonstrable liver functional disturbance, and the presence of abnormal lipid metabolism in migraine are definite pathologic findings. Although their etiological significance remains unsettled, their occurrence establishes the fact that migraine is not merely a functional brain disorder. The fact that food proteins may act as substances toxic to certain patients and that toxic substances do disturb hepatic function suggest that migraine is frequently the result of a toxemia.

Autopsy statistics[24] have proved that the gall bladder of 10 per cent. of persons over 40 years of age is chronically diseased. In the present investigation 45 per cent. of patients over 40 gave well marked evidence of such disease. Furthermore, the diagnosis of duodenal ulcer was made in 9 per cent. of the 78 patients. The unusual frequency of these conditions suggests the possibility that the migrainous state may play a rôle in their production, a view upheld by Kelling[18].

The discussion of treatment of migraine has been limited to that of intraduodenal therapy and the importance of nourishment. Obviously eye strain, working conditions and a host of factors which may affect adversely the organ-

ism often play secondary rôles of more or less import in the individual patient's case. These factors are always to be given consideration, both in the treatment of the patient and in evaluating the effect of the particular therapeutic measures employed. There are also many well known methods for treating migraine. Some of these possibly tend to correct the underlying causative factors. But their discussion is not within the scope of the present investigation.

SUMMARY

1. The findings suggest that the onset of migraine at periods other than adolescence is more common than is usually recognized.
2. Often the only symptom of migraine is paroxysmal headache.
3. Two groups of migrainous patients have been described in which the symptoms resemble those due to intra-abdominal lesions. Nevertheless, such lesions were not demonstrable.
4. Whether the occurrence of positive cutaneous food protein reactions places migraine in the class of anaphylactic or allergic diseases is not established. However, the withdrawal of reacting proteins from the dietary is a rational therapeutic measure.
5. Disturbances in lipid metabolism, abnormal state of liver function and positive protein sensitization reactions are definite pathologic findings which have been demonstrated in migraine.
6. The findings suggest that hepatic dysfunction plays an important rôle in the production of migrainous symptoms.
7. The frequency of association suggests that the migrainous state bears some relation to the etiology of chronic cholecystitis and of peptic ulcer.
8. So-called duodenal ileus is interpreted as an effect and not the cause of migraine.
9. The pharmacological action of and a clinical status for the intraduodenal administration of magnesium sulphate in migraine has been established.
10. The adequate nutrition of the patient is a highly important factor in the treatment of migraine.
11. Surgical operative measures intended to relieve any of the symptoms which may result from the migrainous state should be undertaken with the greatest hesitancy.

BIBLIOGRAPHY

1 Mackintosh, Ashley W., and Anderson, A. Grieg: Migraine and Ophthalmoplegic Migraine. Oxford Med., 1921, VI, 917.
2 Rupert, Mary P. S., and Wilson, Elisabeth E.: A Study of Migraine. Am. Jour. Med. Sc., 1919, CLVII, 361.
3 Wilkie, D. P. D.: Chronic Duodenal Ileus. Am. Jour. Med. Sc., 1927, CLXXIII, 643.
4 Higgins, C. C.: Chronic Duodenal Ileus. Arch. Surg., 1926, XIII, 1.
5 Pagniez, Ph., Vallery-Radot, P., and Nast, A.: Essai d'une thérapeutique préventive de certaines migraines. La Presse Méd., 1919, XXVII, 173.
6 Miller, J. L., and Raulston, B. O.: Treatment of Migraine with Peptone. Jour. Am. Med. Assoc., 1923, LXXX, 1894.
Ball, Fred. E.: Migraine—Its Treatment with Peptone and its Familial Relation to Sensitization Diseases. Am. Jour. Med. Sc., 1927, CLXXIII, 781.
7 van Leeuween, Storm W., and Dr. Zeydner: On the Occurrence of a Toxic Substance in the Blood in Cases of Bronchial Asthma, Urticaria, Epilepsy and Migraine. Brit. Jour. Exper. Pathol., 1922, III, 282.
8 McClure, C. W., and Huntsinger, Mildred E.: Observations on Migraine. Bost. Med. and Surg. Jour., 1927, CXCVI, 270.
9 Vaughan, Warren T.: Allergic Migraine. Jour. Am. Med. Assoc., 1927, CLXXXVIII, 1383.
10 Diamond, J. S.: Liver Function in Migraine, with Report of Thirty-Five Cases. Am. Jour. Med. Sc., 1927, CLXXIV, 695.
11 Hetényi, Geza: Hyperbilirubinämie in der Migräne. Arch. f. Verdauungskr., 1923, XXXI, 247.
12 McClure, C. W., and Huntsinger, Mildred E.: Unpublished Observations.
13 Kelling, G.: Ueber den vermutlichen zusammenhang zwischen Cholelithiasis und Migräne. Arch. f. Verdauungskr., 1922-23, XXX, 59.
14 McClure, C. W., Huntsinger, M. E., and Montague, O. C.: Studies in Liver Function III. Methods for determining the Furfurol Number and the Bilirubin Concentration of Duodenal Contents. Bost. Med. and Surg. Jour., 1925, CXCIII, 1050.
McClure, C. W., and Huntsinger, Mildred E.: Studies in Liver Function VI. Quantitative Methods for Determining the Cholesterol and the Alcohol-Soluble and Insoluble Bile Pigments of Duodenal Contents. Bost. Med. and Surg. Jour., 1926, CXCIV, 812.
McClure, C. W., Mendenhall, W. L., and Huntsinger, M. E.: Studies in Liver Function IV. A Procedure for the Uniform Stimulation of the Biliary Flow. Bost. Med. and Surg. Jour., 1925, CXCIII, 1052.
15 Mendenhall, Walter L., McClure, C. W., and Cate, Mildred: Cholerogic Properties of Magnesium Sulphate. Bost. Med. and Surg. Jour., 1926, CXCV, 76.
16 McClure, C. W., and Vance, Eldora: Studies in Liver Function 2. The Concentrations of Cholesterol, Bile Acids and Pigments of Duodenal Contents in Health and in Diseases of the Liver or its Ducts. Bost. Med. and Surg. Jour., 1925, CXCII, 433.
McClure, C. W., Huntsinger, M. E., and Gottlieb, J.: Studies in Liver Function V. Clinical Observations on the Evaluation and Treatment of Disturbed Liver Function. Bost. Med. and Surg. Jour., 1925, CXCIII, 1054.
McClure, C. W., Mendenhall, W. L., and Huntsinger, Mildred E.: The Evaluation and Treatment of Disturbed Liver Function. Jour. Am. Med. Assoc., 1925, LXXXV, 1537.
17 Blitzsten, N. Lionel, and Brams, William A.: Migraine with Abdominal Equivalent. Jour. Am. Med. Assoc., 1926, LXXXVI, 674.
18 Buchanan, J. Arthur: Abdominal Crises of Migraine. Bost. Med. and Surg. Jour., 1925, CXCII, 667.
19 Buchanan, J. Arthur: The Results of Surgery for Migraine. Surg., Gyn. and Obstet., 1924, XXXVIII, 638.
20 Wheelon, Homer: Duodenal Motility. Radiographic Observations following direct Injection of Barium into the Duodenum. Jour. Am. Med. Assoc., 1923, LXXX, 615.
21 Bolton, C., and Salmond, R. W. A.: Antiperistalsis of Duodenum: Relation to Pyloric Regurgitation. Lancet, 1927, I, 1169.
22 Wheelon, Homer: Symptoms Associated with Duodenal Retention and Reverse Motility. Jour. Am. Med. Assoc., 1926, LXXXVI, 326.
McClure, C. W.: Unpublished Observations.
Davidson, Percy B.: Personal Communication.
23 Walker, I. Chandler: Study III. Studies on the Sensitization of Patients with Bronchial Asthma to Bacterial Proteins as Demonstrated by the Skin Reaction and the Methods Employed in the Preparation of These Proteins. Jour. Med. Research, 1917, XXXV, (new series XXX), 487.
24 Courvoisier, L. G.: Eine Basler Gallensteinstatislik. Corresponz-Blatt f. Schweizer Aerzte, 1913, XLIII, 161.

VERMONT STATE MEDICAL SOCIETY

ACIDOSIS AND ALKALOSIS*

BY JAMES L. GAMBLE, M.D.†

YOU are well aware that, during recent years, certain physiological mechanisms and the derangements of them caused by disease, have been fairly completely described in terms of physical chemistry. Notably, chiefly as a result of the researches of Lawrence Henderson, we have gained an excellent knowledge of the chemical machinery, by means of which the reaction of the body fluids is under normal circumstances kept closely constant in spite of wide variations in the relative amounts of acids and of base metabolized. This knowledge enables us to study satisfactorily the causes producing abnormal values for reaction in the body fluids, and already in many instances clear descriptions of pathogenesis and easily legible therapeutic indications have been obtained.

The solution of a problem in terms of chemistry is, of course, the ultimate goal of any attempt at research in physiology. It is lamentable that when this goal is reached, which is rarely, the knowledge gained often remains for a long time understandable only by those expertly experienced in the conceptions of physical chemistry, and in the mathematical method of describing the interdependence of the factors involved. This is very unfortunate, since the application of such knowledge to the control of disease must be undertaken by practitioners of medicine, who obviously cannot be expected to have a facile knowledge of the terms of chemistry and of higher mathematics.

I have long held the theory that the results of this type of research ought to be translatable into plain English. I must confess that my occasional attempts to establish this theory have never been very successful. The project is really a difficult one. I still hold, however, that it is worth undertaking, and today I beg to submit for your appraisal an attempt to describe acidosis and alkalosis in untechnical terms. It will have to be brief and incomplete, and I shall be content if I can make clear a few essential points.

In order to reach these points without undue loss of time by the way, I must ask you to accept a few initial statements without undertaking to thoroughly explain them. The chief one which I wish you to keep in mind is that the reaction of the body fluids is determined by the relative amounts of free carbonic acid and of its alkaline salt bicarbonate which they contain. Carbonic acid is as you know a weakly acid substance, and is the only acid substance which exists to any extent free in body fluids. The body fluids also contain the salt of this weak acid with strong base; that is, bicarbonate; and this salt behaves as a weakly alkaline substance. These are the only substances in the body fluids which exert a direct effect on reaction; all the other inorganic substances present being salts of strong acids with strong base; that is, neutral salts**. Since free carbonic acid and bicarbonate exert opposing effects as regards reaction, it is obvious that the resultant reaction of a solution containing both of these substances will depend on the relative amounts present. Under normal circumstances these two factors controlling reaction in the body fluids are kept at closely stationary values with the result that a nearly constant reaction is sustained. A change in one or other of these factors will cause a change of reaction. Increase, for instance, of free carbonic acid will cause increased acidity, whereas increase of bicarbonate will cause decrease of acidity.

As regards the mechanism of control of these factors; the concentration of free carbonic acid in the plasma is determined by the concentration of CO_2 in the residual air in the lungs and this in turn depends on the rate and volume of lung ventilation. So that we may say that the free carbonic acid factor is controlled by the respiratory mechanism. And so excellent and dependable is this control that even under severely abnormal conditions, we practically never find a disturbance of body fluid reaction, due to an incorrect concentration of free carbonic acid. It is of course possible that intracranial lesions may affect the respiratory center, and cause acidosis or alkalosis by disturbing respiratory control of the concentration of free carbonic acid in the plasma. But this happens extremely rarely. So that we may here derive the useful statement that whenever we encounter acidosis or alkalosis clinically, we can be practically certain that we have to deal with a change in the other factor, bicarbonate. We are thus conveniently permitted to focus on the plasma bicarbonate in our attempts to explain abnormalities of reaction. The data which I have to show you are presented with

*From the Department of Pediatrics of the Harvard Medical School and the Medical Division of the Children's Hospital, Boston.

Read at the Vermont State Medical Meeting, on October 12, 1928.

†For record and address of author see "This Week's Issue," page 1337.

**With the purpose of simplifying discussion, the presence in the plasma of the acid and alkaline salts of phosphoric acid is here ignored. Further justification for this omission is that, although these substances play an important rôle in regulating the acidity of urine, they are not direct factors in the control of plasma reaction, since here the ratio of their concentrations *follows* the reaction established by the carbonic acid: bicarbonate ratio

the purpose of explaining changes in the plasma bicarbonate caused by various abnormal conditions.

In order to understand a change in bicarbonate, we must first learn the factors which determine its value under normal circumstances. These I will try to describe with the help of a diagram showing the acid-base composition of normal blood plasma; (Figure 1.) The left

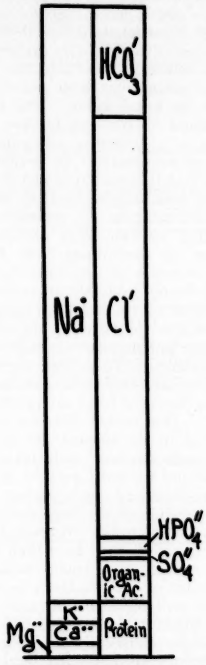


FIGURE 1. The acid-base composition of normal blood plasma. The data used in constructing the diagram were the average normal values for the individual factors expressed as cc. 0.1 or per 100 cc. The values for the bases are superimposed in the left hand, and those for the several acid radicals in the right hand column.

hand column represents the total concentration of fixed base. As you see, it is composed of magnesium, calcium, potassium, and sodium; sodium being by far the largest factor. In the other column, the acid substances which cover the plasma base are represented. Here is the plasma protein which behaves as an acid substance; then we have certain organic acids; then in small concentrations the radicals of sulphuric and phosphoric acid, (SO_4'') and (HPO_4'') respectively; then this large concentration of chloride ion, (Cl'), and finally at the top bicarbonate, (HCO_3'). The line down the center of the diagram illustrates a very important point; namely, that the so-called salts of the plasma are practically entirely dissociated into their component ions. And a still more important fact to keep in mind is that the concentrations of the radicals of these so-called salts may change independently of each other. For instance, as I shall presently show you, there may occur an increase of chloride ion without any change in sodium. Obviously, then, our habit of thinking of the inorganic substances in the plasma as salts is entirely incorrect, since what we have to deal with are separately controlled concentrations of individual ions.

The one all-important requirement of the acid-base structure of the plasma is that the sum of the acid radicals be kept exactly equal with the sum of the basic ions. Otherwise, strong acid or strong base would be exposed and this would cause a large and fatal change of reaction. The situation of exact acid-base equivalence, which the diagram describes, is sustained by a unique adjustability of the concentration of bicarbonate ion, (HCO_3'). That is, in the presence of change in any of the other factors, bicarbonate will extend or recede in such a way as to keep total base and total acid exactly equivalent. For instance, if the chloride ion (Cl') in the plasma increases above its usual value, bicarbonate (HCO_3') will decrease correspondingly. The physical reason for this is that chloride ion has a much stronger affinity for base than bicarbonate ion, and will replace it to such extent as it increases. The same is true for any of the other acid radicals present in the plasma. The released bicarbonate ion becomes free carbonic acid, and is rapidly removed by way of the lungs. Now let us suppose that, instead of chloride ion concentration being increased, it is reduced below the normal value. The bicarbonate concentration will then extend because the base, uncovered by chloride recession, will be immediately bound by bicarbonate ion derived from the free carbonic acid always present in the plasma. The chief physiological purpose of the presence of bicarbonate in the plasma is to maintain by its automatic adjustability the balance of acid and basic ions which the diagram represents. It should be noted that the acid-base "balance" here referred to does not imply neutrality of reaction, since to such extent as base is covered by bicarbonate ion we have present the alkaline substance bicarbonate. The remainder of the diagram, being composed of strong base and strong acid may be taken to represent "neutral" substances. Obviously adjustability of bicarbonate involves a change in size and this must cause a change of reaction. The extent, however, of the change in reaction caused by even considerable deviation of bicarbonate from its usual value is enormously less than would be produced by an exposure of strong base or strong acid which bicarbonate adjustability prevents.

Here we must remember that change in size

of the bicarbonate concentration may be compensated for to a certain extent as regards reaction by respiratory adjustment of the concentration of the other factor, controlling reaction; namely, free carbonic acid. For instance, if the plasma bicarbonate is lowered, the reaction of the plasma will change in the direction of acidity. Theoretically, this change can be prevented by a corresponding reduction of the free carbonic acid of the plasma. In the presence of a lowered bicarbonate, the respiratory mechanism usually does undertake to lower the free carbonic acid in the plasma by an increased ventilation of the lungs. This attempt at compensation gives us our one clinical sign of acidosis, which we call *hyperpnoea*. Compensation by respiratory adjustment of free carbonic acid is, however, never more than partial, so that whenever we find any considerable reduction of the plasma bicarbonate we know that the reaction of the plasma has actually to some extent changed in the direction of acidity, and we can correctly describe the situation as acidosis.

Returning to the diagram, I hope I have succeeded in indicating that a change in bicarbonate is not a primary event, but is the result of change in some other factor or factors in this structure. In other words, when we find a change in bicarbonate we should remember that this is not a mistake on the part of bicarbonate, but is a necessary physiological adjustment, with the purpose of maintaining acid-base equivalence in the plasma. It is also evident that in undertaking to learn the cause of an observed change in bicarbonate we must bring into view the other factors in the acid-base structure of the plasma. The diagrams in Figure 2 describe structural defects in the plasma resulting from various abnormal conditions and these defects explain the change found in the concentration of bicarbonate. The diagrams are constructed from direct measurements of three chief values: the concentrations of total fixed base, of chloride ion, and of bicarbonate ion. The practicability of studying in this way plasma from patients we owe to the remarkably ingenious and dependable method recently devised by Fiske for measurement of total base; i.e., the sum of the concentrations of the four bases indicated in Figure 1, by a single procedure requiring only two cc. of plasma. It will be noted that the diagrams do not include individual measurements of the smaller acid factors shown in Figure 1. The sum of the concentrations of these factors is measured by the extent to which fixed base is uncovered by (HCO_3') plus (Cl') and is designated (R') in the diagrams. The diagrams will, it is believed, readily explain the values for bicarbonate if it be kept in mind that the size of (HCO_3') is determined by the extent to which total base extends above the sum of the other acid factors. The first diagram presents for comparison the values found in normal plasma.

We may now consider briefly the abnormal circumstances which have caused the various defects in the acid-base structure of the plasma which these diagrams illustrate. *Diagram No. 1* is constructed from measurements obtained from the blood plasma of a patient with a cancer of the pylorus which had rather suddenly produced an almost complete obstruction. Before entering the hospital the patient had for several days vomited stomach secretions almost continuously. You see a huge increase in the concentration of bicarbonate ion and the cause of this is at once evident; the concentration of chloride ion which is normally the chief acid factor in the plasma has been reduced to about one-third of its usual value. The alkalosis of upper intestinal obstruction is thus easily understandable as a necessary extension of bicarbonate ion concentration in replacement of chloride ion lost in vomited stomach secretions. The diagram also informs us that, large as the bicarbonate actually is, its extension has been greatly limited by two other changes; an appreciable loss of fixed base from the plasma and a large increase of the value for (R'), the later change being probably in large part due to concentration of plasma proteins as a result of the extensive dehydration of the plasma which always accompanies continued loss of stomach secretions. The data represented by *Diagram No. 2* are from the plasma of an infant suffering severely from infectious diarrhoea (dysentery). This infant did not vomit. The changes found in the plasma are the result of loss in diarrhoeal stools of material drawn from the blood plasma for construction of the digestive secretions entering the intestine. Agreeing with our knowledge of the composition of these secretions we note in the diagram a relatively larger withdrawal of fixed base than of chloride ion causing reduction of bicarbonate, in which change extension of (R') is also a factor. These two diagrams will serve to illustrate changes in bicarbonate made necessary by deformities of plasma structure caused by the large group of disease conditions accompanied by vomiting or diarrhoea, the former tending to cause alkalosis and the latter acidosis. In either case, there is an accompanying, and usually extensive, dehydration and treatment of this condition by the simple expedient of supplying salt solution abundantly also corrects the bicarbonate concentration; that is, sodium and chloride being adequately supplied, the kidney regulates their excretion individually in such manner as to restore the usual bicarbonate value.

Diagram No. 3 shows the way in which an acidosis is produced for a therapeutic purpose by administration of a so-called acid-producing salt. The measurements here used are from an infant with tetany who was receiving calcium chloride by mouth. As may be seen in the diagram the reduction of bicarbonate is due to a single change; a large extension of the concen-

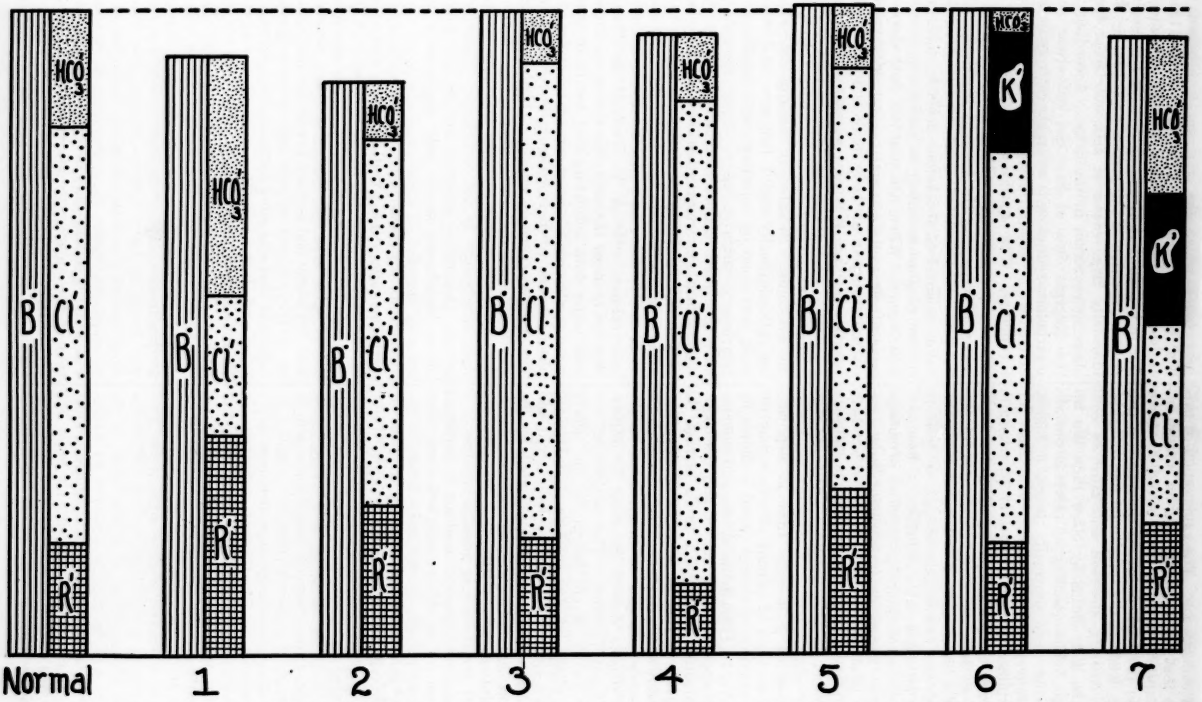


FIGURE 2. Diagrams showing various defects in acid-base structure of the blood plasma and the necessary change in bicarbonate. *No. 1*, Alkalosis of pyloric obstruction. *No. 2*, Acidosis caused by diarrhoea. *No. 3*, Calcium chloride acidosis. *No. 4*, Chloride acidosis in tubular nephritis. *No. 5*, Retention acidosis in glomerular nephritis. *No. 6*, Acidosis due to ketosis; diabetes. *No. 7*, Alkalosis in the presence of ketosis; upper intestinal obstruction.

The diagrams are constructed from direct measurements of total fixed base (B'), chloride ion (Cl') and bicarbonate ion (HCO'3). The smaller acid factors (see Figure 1) were not individually measured; they are contained in the remainder (R').

tration of chloride ion. The explanation of this change is that the ingested calcium almost entirely escapes absorption and, bound by fatty acids from the food, is lost in the stools as calcium soap, whereas the companion ion, chloride, is nearly entirely absorbed and must be covered in the body fluids by other than the ingested base. The quantity of chloride ion absorbed being very unusually large, a higher level of conveyance is necessary and base for this is obtained at the expense of bicarbonate.

The measurements composing *Diagram No. 4* describes a moderate chloride acidosis in the plasma of a child afflicted with tubular nephritis. Here the bicarbonate change is seen to be due to an appreciable reduction of base and a large increase of chloride, the effect of change in these two factors on bicarbonate being considerably offset by a decrease of (R′) which may be explained as the result of the low plasma protein found in this disease. These findings are fairly characteristic of tubular nephritis. In the so-called glomerular form of nephritis various distortions of plasma structure may occur. An example of change found is shown by *Diagram No. 5*. Here the total base and chloride values are approximately normal and the bicarbonate reduction is referable to an increase in (R′), apparently due to retention of some factor or factors in this value. Diagrams 4 and 5 thus illustrate changes in bicarbonate resulting from plasma defects referable to impairment of renal function. The acidosis of nephritis is rarely severe except in the nearly terminal phase of the disease. Distressing hyperpnoea occurring then may be relieved and possibly death from acidosis prevented by the intravenous administration of sodium bicarbonate solution, but at this stage the ultimate outcome of the disease is usually hopeless.

The commonest cause of acidosis is displayed by *Diagram No. 6*. This cause is ketosis; that is, the accumulation in the body fluids of incompletely oxidized fatty acids in the form of beta-oxybutyric acid and diacetic acid. These acids must be conveyed for excretion in the urine covered by fixed base. The area designated (K′) in the diagram shows how extensively these acids replaced bicarbonate ion in the plasma of a child entering the hospital in diabetic coma. This diagram is also descriptive of the manner of bicarbonate reduction in ketosis accompanying various other abnormal conditions; such for example as starvation, cyclic vomiting, and infectious diseases. The logical agent for the treatment of acidosis due to ketosis is, of course, glucose, since if the level of carbohydrate metabolism can be sufficiently raised, the accumulation of ketone acids in the body fluids will be rapidly removed by oxidation. If the situation is urgent, glucose must be given intravenously and if, as here, the ketosis is due to a diabetic inability to utilize sugar, insulin must also be given. A point of importance which the diagram brings out is that there has been no reduction of fixed base. It is often inferred in descriptions of acidosis due to ketosis that bicarbonate reduction results from a depletion of the plasma fixed base by the unusually large excess of acid over fixed base claiming excretion in the urine. According to the diagram, loss of base did not occur and bicarbonate reduction is referable entirely to the extent of the concentration of ketone acids in the plasma. The significance of this is that it is unnecessary to use sodium bicarbonate as a means of repairing the lowered bicarbonate in the plasma. Fixed base remaining at its usual value, removal of the ketone acids by administration of glucose suffices to completely restore bicarbonate. When acidosis was first devised some fifteen years ago and we learned that abnormal acidity in the body fluids is due to bicarbonate reduction, it seemed an easy and an apparently correct inference that the proper procedure was to vigorously administer this lacking substance. Bicarbonate therapy was taken up enthusiastically and I feel sure that much harm was done by injecting thick solutions of bicarbonate intravenously. Until recently I have inveighed against bicarbonate therapy in acidosis without reservation; within the last year or so, however, I have come to believe that in occasional situations bicarbonate therapy may be of use. I have in mind, chiefly, severe diabetic acidosis. Dr. A. V. Bock, of the Massachusetts General Hospital, has shown me rather convincing data indicating that insulin is more rapidly effective, if the abnormal acidity of the plasma is first to some extent reduced by an injection of bicarbonate solution. However, I am still convinced that in ketosis as usually encountered glucose is all that is required, and that bicarbonate is not indicated. There are certain theoretical grounds for regarding the use of bicarbonate as not only unnecessary but actually harmful.

The data represented by *Diagram No. 7* describe an interesting situation which will serve to further illustrate the interdependence of the acid-base factors in the plasma. They are from a little girl with an upper intestinal obstruction. Acetone bodies were found abundantly in the urine. It was at once and quite naturally supposed that she must have an acidosis, and a sample of plasma was taken in order to find out to what extent bicarbonate was reduced by the ketosis. It was a great surprise to find that, instead of reduction, there was a large extension of bicarbonate. The ketone acid concentration in the plasma was measured and it also was found to have a large value. The other chief factors of plasma structure, fixed base and chloride ion, were then determined and assembling the several data in a diagram, explanation of the apparently anomalous situation of an alkalosis in the presence of ketosis is clearly obtained. It consists in the very large recession

of chloride. As we have seen, loss of chloride tends to cause extension of bicarbonate and accumulation of ketone acids tends to reduce bicarbonate. Here both of these events occur together; a loss of chloride due to continued vomiting of stomach secretions and a severe ketosis resulting presumably from starvation; and bicarbonate extension is explained by the fact that chloride reduction is of greater extent than the accumulation of ketone acids. It is interesting to note how greatly the ketone acid concentration limits the extent of bicarbonate increase. Indeed it would seem probable that the presence of ketone acids has here prevented an alkalosis of fatal degree. The situation which the diagram describes is also very interesting from the point of view of therapy. We are expected to restore a greatly lowered chloride and at the same time remove a large accumulation of ketone acids. Evidently, if chloride be restored faster than ketone acids are removed, too extensive bicarbonate reduction and acidosis may be produced. On the other hand, if ketone acids be too rapidly removed further increase of bicarbonate must result. In the case of this patient, circumstances did not permit proceeding cautiously and experimentally. Glucose was given intravenously and large amounts of salt solution by subcutaneous injection. The actual outcome was that the ketone acids disappeared more rapidly than chloride rose so that further increase in bicarbonate was present when operation for removal of the intestinal obstruction was performed the next day. Repair of the initially severe dehydration, the more important purpose of the treatment, was however fairly satisfactorily accomplished and the patient underwent operation without apparent inconvenience from a considerable degree of alkalosis.

Our purpose in presenting the diagrams in Figure 2 may here be briefly summarized. Since change in the plasma bicarbonate is to be regarded as a secondary event and in the nature of an adjustment, it is obvious that, in the presence of acidosis or alkalosis, correct choice of therapeutic measures depends on recognition of the underlying disease and knowledge of the alterations in the acid-base structure of the plasma which it may cause. The several types of abnormal circumstance which may cause distortion of plasma structure can be briefly indicated: (1.) Conditions which interfere with reabsorption of digestive secretions and thereby cause depletion of plasma materials. (2.) Impairment of renal function with consequent inaccuracy of control of the concentrations of plasma substances. (3.) Depression of the level of carbohydrate metabolism permitting accumulation of incompletely oxidized fatty acids. The plasma changes which are fairly characteristic for each of these three groups of disease conditions are illustrated by actual examples in Figure 2. This information permits selection of the correct agent for plasma repair from the several simple materials at hand, namely sodium chloride, sodium bicarbonate and glucose. It should be mentioned here that, although repair of the plasma by such agents is often most urgently indicated, we should regard our attempts in this direction only as a means of gaining time in which to combat the underlying disease.

I realize that I have given you an extremely sketchy description of acidosis and alkalosis. The chief purpose of my attempt has been to indicate by means of these diagrams various defects in the chemical anatomy of the plasma which make necessary a change in bicarbonate. What I especially hope that the diagrams have made clear is the interdependence of the various parts of the acid-base structure of the plasma and the necessity of bringing them all into view if we are to understand changes in bicarbonate, accompanying various conditions of disease, in a way which will give us a clear account of pathogenesis and correct indications for treatment.

MISCELLANY

REPORT OF BENNINGTON COUNTY MEDICAL SOCIETY

The annual meeting of the Bennington County Medical Society was held Nov. 28.

There was much discussion and criticism relative to the activities of visiting nurses, it was the consensus of opinion that these agencies were greatly exceeding their rights and duties and a complaint was lodged with the local chapter of the Red Cross.

It was the opinion that the sum allowed for the medical inspection of school children was altogether too little, twenty cents being the amount paid for each examination. It is thought that a prosperous town of ten thousand people desiring medical examination of Public School children should be willing to pay a fair price for this service.

A communication from W. Scott Nay, M.D., Secretary of the Vermont State Board of Medical Examiners, was read. The communication referred to the status of irregular practitioners and urged legislation accurately defining the status of such practitioners. Dr. Nay is referred to the resolution presented in the House of Delegates by Dr. Lane at the last State meeting; this resolution was introduced at the request of the Bennington County Medical Society.

The Annual Election of Officers was held and the following were chosen:

President, Frank J. Hurley.
Vice-President, Lucretius H. Ross.
Secretary and Treasurer, John D. Lane.
Auditor, Frank E. Dean.
Delegate, Henry S. Goodall.
Alternate, E. M. Gardenier.

Signed—JOHN D. LANE, M.D., *Secretary.*

REPORT OF WINDHAM COUNTY MEDICAL SOCIETY

The annual meeting was held at The Rockingham Hospital, Bellows Falls, on Wednesday, Nov. 14.

The following officers were elected—

President, Dr. W. J. Kaine of Brattleboro.

Vice-President, Dr. A. C. Walker of South Londonderry.

Secretary-Treasurer, Dr. A. C. Black of Brattleboro.

Two new members were voted in: Dr. L. H. Bugbee, Putney, Vermont; Dr. A. D. Sutherland, Brattleboro, Vermont.

Guest speakers—

Dr. E. J. Halloran of Worcester, Mass., presented an instructive paper on "Chronic Myocarditis."

Dr. D. E. Harriman of Springfield, Mass., gave a most helpful discussion of "Some Common Skin Diseases."

Respectfully submitted,
Signed—A. C. BLACK, *Secretary.*

VERMONT DEPARTMENT OF PUBLIC HEALTH REPORT FOR NOVEMBER, 1928

The status of communicable diseases as reported during the month shows fewer cases of diphtheria than last month, eight cases being reported in four counties. Eighty-one cases of scarlet fever were reported, a number of cases occurring in one or two small towns. The outstanding item in regard to communicable diseases this month is 106 cases of mumps reported in Springfield. No typhoid fever has been reported. Five more cases of poliomyelitis have been reported, making the total now for the year forty-six cases. The occurrence of other diseases is as follows: Chickenpox 139, German measles 8, epidemic sore throat 2, measles 117, mumps 183, smallpox 4, tuberculosis 16 and whooping cough 101.

The Laboratory of Hygiene reports the following examinations made during the month:

Examinations	
For diphtheria bacilli	688
For Widal reaction of typhoid fever	17
For malarial parasites	0
For tubercle bacilli	178
For evidence of syphilis	328
For gonococci in pus	138
Of blood for contagious abortion in cattle	145
Of water, chemical and bacteriological	66
Of water, bacteriological	112
Of milk, market	34
Of milk submitted for chemical only	10
Of milk submitted for microscopical	22
Of foods	11
Of drugs	0
For the courts, autopsies	5
For the courts, miscellaneous	22
Autopsies to complete death returns	0
Miscellaneous examinations	63

The Venereal Disease Division submits the following report:

Cases of gonorrhea reported	45
Cases of syphilis reported	49
Cases of gonorrhea reporting for treatment	0
Cases of syphilis reporting for treatment	4
Cases for intravenous treatment	2
Total treatments	12
Gonorrhea outfits distributed	121
Syphilis outfits distributed	208

In the Tuberculosis Division the Director talked to high school students in fourteen towns. Ten thousand copies of the *Modern Health Crusader* were published and distributed.

The Poliomyelitis After-care Division made 66 home visits, fitted 17 new pieces of apparatus, made six corrections to shoes. Six pieces of apparatus were altered or repaired. Two sales were held by the vocational worker, the receipts amounting to $320.36.

The nurse in the Maternity and Infancy Division visited several towns giving talks to Parent-Teachers' Associations, women's clubs, etc.

UNIVERSITY OF VERMONT MEDICAL COLLEGE NOTES

Dr. J. B. Wheeler, Dr. Lyman Allen, Dr. P. E. McSweeney and Dr. G. M. Sabin attended the recent meeting of the New England Surgical Society held in New Haven, Conn. Dr. Allen read a paper as part of a symposium on Pelvic Surgery.

On Saturday, November 24, a closely contested football game was played between the U. V. M. varsity and a team composed of students in the Medical College. The game resulted in a 13-0 victory for the varsity, but the game was much closer than the score indicates. The medics presented a galaxy of former stars from several colleges and, considering the fact that the team had had very little practice, played a whale of a game. The varsity scores were the result of a fumble and a blocked punt. George Tully, former all American end for Dartmouth, now a sophomore student in medicine and line coach for the U. V. M. Varsity, was the outstanding star of the game.

Dr. F. K. Jackson, Professor of Physiology, has resumed his college duties after being confined by illness to his home for nearly a month.

Dr. F. W. Sears, former Professor of Neurology, is recovering slowly at the Bishop De Goesbriana Hospital from a slight cerebral hemorrhage.

CHITTENDEN COUNTY CLINICAL SOCIETY

On Thursday evening, December 6, the monthly meeting of the Chittenden County Clinical Society was held at the Medical College. Dr. C. H. Bonner, Supt. of Danvers State Hospital, was the speaker, his subject being "A Review of the More Common Psychoses and the Preventative Aspect of Mental Diseases." Dr. Truman Allen led the discussion after which a buffet lunch was served.

W. T. REES, M.D.

62 Bradley Street, Burlington, Vt.

Additional Item under the Heading "County Medical Society" received too late for insertion here. See page 1337.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 14451

FOUL SPUTA AND PAIN IN THE RIGHT CHEST

MEDICAL DEPARTMENT

First admission: An Italian tailor forty years old entered January 21 complaining of lung trouble.

Two years before admission he had "bronchitis". After this he was perfectly well until March, nine months before admission, when he had pain in the region of the right scapula lasting only a few minutes. He felt well for a week. Then he began to spit up very foul blood streaked sputum, three cupfuls a day. He had fever and was in bed two or three weeks. Then he worked two days a week for two weeks. Then he was ill again, and had not worked since that time. He had had foul sputum ever since the onset. He coughed a great deal at night. At present he was raising one to two cupfuls of sputum a day. He had seen no blood for months. He had had intermittent periods of temperature. He had occasional pain in the right chest in the region of the third to the sixth ribs in front running nearly horizontally around the axilla to the back. He had never had pulmonary hemorrhage. During the past year he had had many neck sweats at night, no general sweats. His bowels were constipated. His best weight was 154 pounds, his present weight 135. He had lost 15 pounds in the past year.

His family history is negative except that his mother died of shock.

He had gonorrhea at twenty-two. Ten years before admission he had a white stool once only. For four months he had urinated once at night at times. A month before admission he caught cold, had pain in the chest and at the same time swelling of the left knee with pain on walking lasting four days.

Clinical examination showed a well nourished, sallow man. The right chest was slightly flattened. Respiratory movements were decreased in comparison with those of the left chest. There was slight dullness throughout the entire right chest, most marked in the lower half posteriorly, where there was a suggestion of bronchial breathing. The left chest was not remarkable. The fingers were clubbed. The rest of the examination was negative.

Urine normal. Blood not recorded. The sputum showed 50 spirochetes in a five-minute search.

X-ray examination showed the diaphragm normal. The right lung field was smaller and less radiant than the left. There was diffuse irregular mottling extending from the base to the apex, most prominent in the hilus and the cardiophrenic angle. Fluoroscopically the area of greatest dullness appeared to be at the lung root on the right side. No definite fluid level could be seen.

Until January 23 temperature 98.4° to 99.3°, pulse 87 to 110, respirations normal. Afterwards temperature 96.8° to 100.8°, pulse 72 to 122, respirations 19 to 43.

By advice of the Thoracic Clinic bronchoscopy was done January 25. It was essentially negative. Nothing pathological was noted in the right bronchus except increasing hyperemia of the lining. In spite of the use of a large amount of cocaine it was impossible to control the patient's cough. The terminal bronchus was seen. Except for redness nothing pathological was noted. 20 cubic centimeters of lipiodol was introduced to various points of the right bronchus but was immediately coughed up. The patient was discharged February 1 with advice for a course of neoarsphenamin in the Out-Patient Department. His weight at discharge was 115½.

History of interval. In the South Medical Department he was given seven intravenous injections of neoarsphenamin 0.3 grams. His Wassermann was negative. No indication of lues was found. He thought the treatment did him no good. He raised more sputum at night. It was however less foul than when he was in the hospital, and he gained a little weight. Every two or three weeks he had a temperature of about 100° for a day or two. He often had pain for a short time in the right chest in front and at the side. A month before readmission the pain was so severe for twenty-four hours that he could not cough. During the interval between admissions he worked three to four hours a day two or three times a week. In April examination in the Pulmonary Clinic showed his weight 123½, temperature 99.6°, pulse 126, all signs at the right base somewhat better since the neoarsphenamin.

Second admission, May 4.

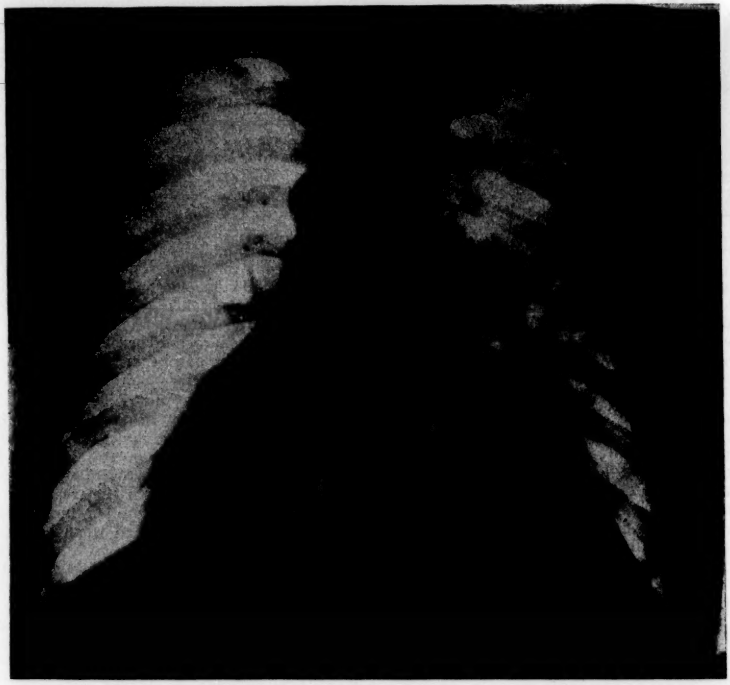
On clinical examination he was rather thin, coughed persistently and raised much purulent sputum. There was pyorrhea. The left breast was semi-feminine in character. The point of maximum intensity of the heart was in the midline at the ensiform process. The left border of dullness was slightly inside the left nipple line, the right border at the right nipple line. The sounds were heard best at the point of maximum impulse, also heard well at the fifth interspace and the left border of the sternal

junction and in the left midaxillary line. They were not heard at all well in the usual apical region. The fingers were markedly clubbed. The expansion of the lungs was equal. In the back the breath sounds in the left lung were fairly harsh and diminished on the side in the axillary line. Some crackling râles were heard at the left base. In the right back the breath sounds were very harsh at the apex, harsh with shallow breathing throughout the rest of the lung except on the side in the axillary line, where the sounds were diminished, and in two small regions medial to the right scapula and just above the right base, where the breathing was cavernous. Spoken voice was loud in both backs. Vocal fremitus was greater in the right lung, especially increased above the right scapula. In front the breath sounds were shallow and harsh throughout the right lung but diminished in the axilla, where a few crackling râles were heard. In the left front the breath sounds were shallow, but less harsh than in the right, and less diminished in the axilla.

The urine was negative. The blood is not recorded. The sputum showed no tubercle bacilli.

Temperature 98° to 101°. Pulse 77 to 111. Respirations normal except for one increase to 30 the day before operation.

X-ray examination showed the process in the right chest more extensive than at the previous examination. It now extended well into the apex.



Case 14451. The right lung field is smaller and less radiant than the left. There is diffuse irregular mottling extending from the base to the apex, most prominent in the hilus and the cardiophrenic angle. No definite fluid level can be seen.

May 10 operation was done. Soon after reaching the ward the patient became cyanotic, had rapid pulse, and passed into a state resembling shock except that the blood pressure was not especially low. He was given oxygen, and seemed to improve in color and a very little in general condition. At midnight he died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

If this history is accurate it means lung abscess or bronchiectasis. Spitting up quantities

of foul sputum is as nearly pathognomonic as anything we have.

It seems as if this history all comes back to the things we started with, foul sputa and symptoms in the right chest whereby we expect abscess or bronchiectasis.

The X-ray plates show a great deal of mottling. In the earlier plate it looks as if it was higher up. It is a good deal more diffuse than I should have expected from the history, more like bronchiectasis.

In giving injections of neoarsphenamin they were not thinking at all of syphilis but were giving it because the spirochetes found in the lung might respond in the way other spirochetes do.

NOTES ON THE PHYSICAL EXAMINATION

I do not make much of the physical examination. It seems to me the X-ray and the cavernous breathing are the two things that, with the sputum, are important.

DIFFERENTIAL DIAGNOSIS

I have not a doubt that before this operation was done either the patient or his friends were told that there was a pretty good chance of its producing this result. That is, a lung abscess under these conditions has a poor prognosis. He had been sick for a long time and I imagine he said he would rather take his chances even knowing that his chances were poor.

I do not see that we have anything outside the chest to consider. It looks as if the heart had gone over towards the right, presumably by contraction of that lung, with a fibrotic process around the abscess. Just where the abscess is or whether there were multiple abscesses I do not know. I should suppose there were multiple abscesses. They did not reach any single cavity by the bronchoscopy. They hoped that they might be able to drain something that way. The fact that they did not reach it or see it seems to mean that it is not very close to the hilus. I do not see any reason to believe that the heart is abnormal.

Of course this is the sort of case in which we get renal and splenic amyloid, but we have no evidence of amyloid, no enlargement of the spleen and no urinary changes. So we have just to mention the possibility and leave it.

In the right lung there ought to be a lot of fibrotic change, a lot of fibrosis, presumably adhesions, I should suppose abscess. It is the sort of case where the distinctions between bronchiectasis and multiple abscesses are not very important. The reason I prefer to call it abscess is because of the sudden onset. Bronchiectasis generally comes on gradually, not as this apparently did suddenly.

A STUDENT: Could this be tuberculosis rather than abscess?

DR. CABOT: They had a first rate chance to find tubercle bacilli. I think in a case like this that negative findings of tubercle bacilli are very good evidence against tuberculosis. One negative sputum is nothing, but six or twelve are strong evidence. Then advanced tuberculosis is almost certain to show something on the other side, and there is nothing by X-ray on the other side.

A STUDENT: Why do you think it is abscess rather than bronchiectasis?

DR. CABOT: I think probably there is bronchiectasis too. The whole distinction is that bronchiectasis in the ordinary sense is a chronic slow process, whereas this started acutely and then spread.

A STUDENT: Do you think he might have had pericarditis?

DR. CABOT: I should not suppose so. We had no reason to suppose pericarditis. I am not strong on that diagnosis and might well miss it here, but I do not see any evidence of it. Pericarditis does not displace the heart.

A STUDENT: Have you considered lung gangrene?

DR. CABOT: Yes. That is a question of smell and of what organisms we find. That is, the distinction between abscess and gangrene is a perfectly unimportant one. They do not appear to have felt as violently about the smell as they usually do in cases of gangrene. When it is so bad that nobody can go into the room it is called gangrene.

A STUDENT: How do you account for the spirochetes? By secondary infection from the mouth?

DR. CABOT: Yes.

A STUDENT: Is there anything that rules out syphilis of the lung except that the condition is rare?

DR. CABOT: That plus the fact that we do not know how to diagnose syphilis of the lung. We have no clinical picture of it. Then we do not know of syphilis producing a chronic suppurative process.

A STUDENT: Actinomycosis?

DR. CABOT: There again they had a good chance to find it in the sputum and they did not find it. I think we have to rest on that. Ordinarily there would be more involvement of the chest wall too. Actinomycosis of the lung usually involves the chest wall.

A STUDENT: Could this be a spirochetosis?

DR. CABOT: If by that you mean a process of abscesses and a chronic fibroid process with spirochetes in it, that is exactly what we have. If you mean that the spirochetes are the cause of it, I should say no. We have no evidence that spirochetes do this. On the other hand spirochetes in the mouth do get into these abscesses and are found there. So I should say it would not be well to name a process by the secondary invading organism.

A STUDENT: Did you say there was not enough evidence of dilated right auricle?

DR. CABOT: Yes, I should say there was not.

The whole heart seems to be over on one side, and so one cannot distinguish a change in any one chamber.

X-RAY INTERPRETATION, FIRST ADMISSION

The findings are those of a chronic destructive and fibrosing process chiefly in the hilus but reaching the major portion of the entire right lung, consistent with abscess.

X-RAY INTERPRETATION, SECOND ADMISSION

The findings are consistent with abscess.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Chronic lung abscess.

DR. RICHARD C. CABOT'S DIAGNOSIS

Multiple lung abscess with chronic interstitial pneumonitis and probably some bronchiectasis.

ANATOMIC DIAGNOSES

Bronchiectasis.
Chronic interstitial pneumonitis.
Bronchopneumonia.

DR. TRACY B. MALLORY: The important lesion in the case was a marked fibrosis of the right upper and middle lobes with great dilatation of the bronchi and numerous thin-walled cavities leading off the bronchi filled with slightly foul semipurulent material. Pathologically it is a little more typical, I should say, of bronchiectasis than of multiple abscesses. The changes in the bronchi were very marked indeed. The walls were three to four times the normal thickness, and there was definite dilatation extending well down into the smaller branches. The left lung showed a marked degree of compensatory emphysema and also an early bronchopneumonia.

The heart was entirely negative. There was no hypertrophy of the right heart.

His death came two hours after the operation. It seems almost certain that pneumonia must have started before his operation, and possibly the note that his respirations rose to thirty on the afternoon before operation signifies the onset of pneumonia which was not suspected clinically. Pneumonia is a common termination of these cases. If material is partially expectorated and then drawn down through the bronchi into the other lung a sudden onset of pneumonia is of frequent occurrence. The fresh pneumonia did show a great variety of organisms in the alveoli similar to those found in the abscess cavities on the other side.

DR. CABOT: The only puzzling point to me is still the one I spoke of,—the sudden beginning of this process. Of course we can say that is due to an imperfect history, that his English was not very good. It is hard to think of bronchiectasis beginning suddenly.

A STUDENT: Do you think he had a chronic bronchitis before he had that bronchiectasis?

DR. CABOT: The history does not say that. There is long interval between his bronchitis and the sudden onset of bronchiectasis.

CASE 14452

DISCUSSION OF A CASE OF TYPE I PNEUMOCOCCUS PNEUMONIA

MEDICAL DEPARTMENT

A boy of eighteen, a gardener, born and living in Massachusetts.

Except for slight unproductive cough for a year he had been well until nine o'clock the morning before admission. Then while at work he had headache and malaise. At eleven o'clock he had a slight real chill and severe pain in the left lower chest anteriorly, increased by cough. He went to bed. At seven o'clock in the evening he coughed and raised bloody sputum. There were no eye symptoms, otalgia, coryza, herpes, or sore throat, no respiratory distress or cardiac symptoms. He had no appetite. He vomited small amounts of the fluid he had taken. At admission he had had no bowel movement and had passed no urine since the onset.

Family history negative.

Past history. Measles, whooping cough and mumps. Sore throats until tonsillectomy ten years before admission.

He was seen at seven o'clock in the evening, thirty-four hours after the onset. He was dull and drowsy, but fairly clear mentally; coöperative, though he wanted to be let alone. Hoarse, short, unproductive cough. Well developed and nourished. Skin dry. Mucous membranes of good color. No jaundice. Pupils equal, regular and reacted. Tongue dry, heavy white coat. Slight pyorrhea. Throat negative. Slight stiffness of the neck. Heart impulse not seen, felt 8 centimeters to the left of the middle line in the fifth space. Rhythm regular. Sounds of good quality. A soft systolic murmur at the apex. Blood pressure 95/65. Lungs: over an area the size of the palm below the angle of the left scapula dullness, bronchial breathing, increased whisper and voice, with a few râles mesial to the angle. Abdomen and genitals negative. Reflexes normal. No Kernig.

Blood: 26,000 leukocytes. Two blood cultures negative.

Temperature, pulse and respiration are shown in the chart.

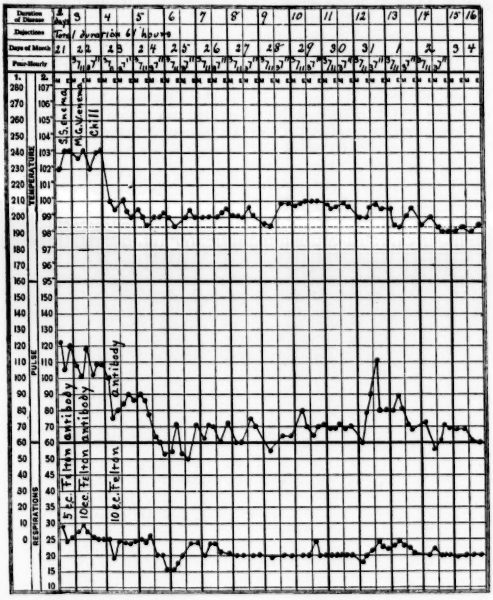
X-ray: Area of mottled density in the left base extending to the angle of the scapula. Right diaphragm high. Costophrenic angle clear. Left diaphragm visible. Increased prominence in both lung roots.

Discussion

BY FREDERICK T. LORD, M.D.

NOTES ON THE HISTORY

The most significant features are sudden onset with chill, stitch in the side, cough and bloody sputum. This complex is almost distinctive of lobar pneumonia. The malaise, headache, anorexia and vomiting may be ascribed to the intoxication.



Except for the first record at admission and those for the last two days and a half the temperature is rectal.

NOTES ON THE PHYSICAL EXAMINATION

The signs are consistent with consolidation of the lung. The stiff neck is probably due to meningial irritation from toxemia.

NOTES ON THE SPECIAL EXAMINATIONS

The elevated white count is consistent with pneumonia.

In the X-ray the mottled character of the increased density at the left base speaks for pulmonary rather than pleural involvement.

DIFFERENTIAL DIAGNOSIS

With such a complex of symptoms and signs there is little chance for error in the diagnosis of lobar pneumonia. Pulmonary infarction is a possibility, but the absence of likely sources of emboli makes it highly improbable. An acute pulmonary tuberculosis is also a possibility, but of this there is no intimation in a family history of the disease or known opportunity for contagion, or X-ray evidence of apical or subapical involvement, and the leukocytosis is against it.

DISCUSSION OF TREATMENT

We are, then, confronted with a lobar pneumonia, and the unusually early stage for hospital praetice of thirty-four hours' duration makes it likely that much benefit may be derived from treatment with antipneumococcic serum provided his infection is due to Type I, and probable benefit if he has a Type II pneumococcus infection. Given a case of lobar pneumonia, there is in general about one chance in three that it will turn out to be Type I, but the young are especially prone to Type I infection and the chance is nearly one in two that this patient will have a Type I infection.

When patients were treated with unrefined Type I antipneumococcic serum, it was thought inadvisable to administer the serum until Type I infection had been established, owing to the doubtful value of specific treatment in other than Type I infections and troublesome reactions which at times followed the intravenous

use of such large amounts as 100 cubic centimeters of whole serum. Felton's antibody, however, permits the intravenous administration of a potent solution in small doses. As it is made from horses inoculated against all three fixed types of pneumococci it is polyvalent. It is of principal value against Type I pneumococcus pneumonia, but reactions following its use are not sufficiently troublesome to make it necessary to determine the presence of Type I infection before its administration, and it may also be of benefit against Type II pneumococcus pneumonia. This antibody can therefore be given at once without waiting for type determination, thus saving at least twenty-four hours to forty-eight hours in the inauguration of the specific treatment of the disease.

Lack of sensitiveness to horse serum having been determined in this case, the patient was given 5 cubic centimeters of antibody solution on the evening of admission, about thirty-four hours after the onset of the disease, and on the next and the following day two doses of 10 cubic centimeters each. In all he got 75,000 units of antibody. The Krumwiede test on a specimen of sputum on the day after admission showed precipitation with Type I diagnostic serum, and Type I pneumococcus was later recovered from a mouse. The rectal temperature fell by crisis, as shown in the chart, between two and three days and reached normal after sixty-two hours from the onset. The short duration of the fever in this case cannot with certainty be ascribed to the serum treatment, as a duration as short as two to three days may occur in from one-half to one per cent of patients with lobar pneumonia without specific treatment.

In our experience this is the 29th patient with Type I pneumococcus pneumonia to receive specific treatment within the first three days of the illness. Only two of the patients in this group have died, a mortality of 6.89 per cent. In general, the mortality in Type I pneumococcus pneumonia without serum treatment is about 20 per cent.

DIAGNOSIS

Lobar pneumonia, Type I pneumococcus.

Case Records

ANTE-MORTEM AND POST-MORTEM

AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

AT THE

MASSACHUSETTS GENERAL HOSPITAL

Published under the direction of

RICHARD C. CABOT, M.D., Chairman and Editor

JAMES H. MEANS, M.D.

EDWARD P. RICHARDSON, M.D.

EDWARD L. YOUNG, JR., M.D.

TRACY B. MALLORY, M.D.

FLORENCE M. PAINTER, A.B., Assistant Editor

VOLUME XIV

1928

INDEX

CABOT CASE RECORDS

VOLUME XIV

1928

The date of publication of any case may be determined from the case number. The first two figures of each case number give the volume number, XIV. The volume this year begins with the JOURNAL of February 23. The third and fourth figures give the week, dating from February 23. The last figure gives the case number for the week. For example, Case 14352 is the second case for the 35th week of Volume XIV.

Abscess of liver, 14432
Abscesses of lung, 14321
  miliary, in heart, kidney and spleen, 14101
Adenocarcinoma of pancreas, 14082
    of stomach, with perforation, 14391
  metastatic, in liver, 14082, 14391
    in lungs, 14082
Anemia, pernicious, 14121, 14442
Aneurysm of aorta, 14381
Angina pectoris, 14224
Anthrax, 14033
  pulmonary, 14032
Aortitis, syphilitic, 14051, 14381
Appendicitis, acute, 14052, 14332, 14402
  gangrenous, 14102
Arteriosclerosis, general, 14191, 14411
    of aorta, 14021, 14291
    of artery, coronary, 14261, 14291, 14381
    of heart, 14191, 14371
    of kidney, 14291
    of valve, aortic, 14051, 14191, 14371
  arteriolar, 14431
  (See also Nephritis.)
Asthma, bronchial, 14202
Brain, hemorrhage into, 14341
Bronchiectasis, 14141, 14451
Bronchitis, asthmatic, 14161
  purulent, 14361
Bronchopneumonia, 14321, 14361
  Friedländer's bacillus, 14231
Carcinoma of intestine, 14062
    of kidney, 14012
    of ovary, 14012
    of pancreas, 14012, 14392
    of rectum, 14122
    of stomach, 14442
  metastatic, in liver, 14112, 14122
    in lymph nodes, 14122
      peritoneal, 14112
    in ovary, 14112
  colloid, of stomach, 14041
  epidermoid, of bladder, 14182
  (See also Adenocarcinoma.)
Cholecystitis, chronic, 14162
Cholelithiasis, 14162
Chorea, acute, 14171
Cirrhosis of liver, infectious, 14071
  toxic, 14031, 14251
Colitis, chronic, 14272
Combined system disease, 14152
Cyst (hydrops folliculi) of right ovary, 14072
Cyst of stomach, 14242
Dermatitis exfoliativa, 14132
Duodenum, peptic ulcer of, 14162, 14332
Effort syndrome and neurosis complicating organic heart disease, 14221-2-3-4
Empyema of pleura, 14322
Endocarditis
  Acute
    aortic and mitral, 14171
  Acute rheumatic, 14382
  Chronic non-deforming, rheumatic
    mitral, 14111
  Chronic, with stenosis and regurgitation
    mitral, 14091
    aortic and mitral, 14021
  Chronic rheumatic, with stenosis and regurgitation
    mitral, 14222
    aortic and mitral, 14351
  Subacute
    mitral, 14151
  Subacute bacterial, mitral, 14111
  Subacute rheumatic, aortic, mitral, pulmonary and tricuspid, 14351
Foreign body in esophagus, 14412
Heart, congenital anomaly of,—interventricular septum defect, 14221
  hypertensive, 14223, 14401
  infarct of, 14181, 14261
  (See also Arteriosclerosis, Endocarditis, Rheumatic disease, Syphilis, Syphilitic aortitis, etc.)
Hemorrhage into brain, 14341
Hydrocephalus, internal, 14252
Hypertension, primary, 14223, 14401
Intestine, infarction of, 14092
  obstruction of, 14072, 14332
  perforation of, 14052
  (See also Duodenum.)
Leukemia, lymphatic, 14211
  myelogenous, 14311
Liver, cirrhosis of, toxic, 14031, 14251
  (See also Abscess, Adenocarcinoma, Carcinoma.)
Lung, infarcts of, septic, multiple, 14301
  (See also Adenocarcinoma, Bronchiectasis, Bronchopneumonia, Pneumonia, Tuberculosis.)
Lupus erythematosus, 14132
Lymphoblastoma, 14211, 14281
  Hodgkin's type, 14421
Meningitis, pneumococcus, 14011
  purulent, streptococcus hemolyticus, 14232
  staphylococcus, 14101
  tuberculous, 14252
Myelitis, diffuse, 14152
Myocarditis, fibrous, 14061, 14281, 14291
  rheumatic, acute, 14382
    subacute, 14351
Myxedema, 14411
Nephritis, arteriosclerotic, 14431
  glomerulo-, acute intracapillary, 14341
    chronic, 14331, 14342
  vascular, 14342
Nephrosis, lipoid, 14212
Nervousness and effort syndrome, 14222, 14223, 14224
Neurosis, cardiac, and effort syndrome, 14221
Osteomyelitis of upper end of femur and ilium, 14142
Pancreatitis, acute hemorrhagic, 14302, 14352
Pemphigus vulgaris, 14192
Pericarditis, acute fibrinous (rheumatic?) 14382
  chronic adhesive, 14021, 14111, 14381
  subacute, with effusion, 14091

Peritonitis, tuberculous, 14271
Pityriasis rosea, 14372
Pneumonia, lobar, 14262, 14282, 14312, 14322
Type I, 14452
(See also Bronchopneumonia.)
Poliomyelitis, acute anterior, 14201, 14362
Prostatism, obstructive, 14172
Rabies, 14022
Rheumatic disease of heart, acute, 14382
chronic, 14222
subacute and chronic, 14351
healed, 14111
Salpingitis, tuberculous, 14271
Septicemia, 14151
bacillus of anthrax, 14032
pneumococcus, 14312
staphylococcus aureus, 14101, 14301
(See also Endocarditis, acute and subacute.)
Sinusitis, frontal, purulent, 14232
Syphilis of heart, 14381
Syphilitic aortitis, 14051, 14381
Thrombi in auricles and ventricles of heart, 14061
in great venous sinuses of cranium, 14131
mural, in ventricle, 14261
Trichinosis, 14292
Tuberculosis of genito-urinary tract, 14241
of lung, 14271, 14422
of meninges, 14252
of peritoneum, 14271, 14441
miliary, 14271
Typhoid fever, 14081
Yellow fever, 14042

AUTHORS OF DISCUSSIONS

Other than Dr. Richard C. Cabot and Dr. Edward L. Young, Jr.

Allison, Nathaniel, 14142
Ayer, James B., 14152
Bock, A. V., 14232, 14262, 14292, 14342
Caner, G. Colkett, 14252
Clifford, Randall, 14422
Coues, W. Pearce, 14032, 14033
Crabtree, Harvard H., 14182
Davis, Lincoln, 14062
Garland, Joseph, 14412
Greenwood, Arthur M., 14132
Guild, B. Thurber, 14162
Jones, Chester M., 14212
Jones, Daniel Fiske, 14302
King, Donald S., 14202
Lane, C. Guy, 14372
Lord, Frederick T., 14452
Lyon, Arthur Bates, 14362
Magrath, George Burgess, 14022
McKittrick, Leland S., 14352
Means, James H., 14442
Miller, Richard H., 14332
Oliver, E. Lawrence, 14192
Reggio, A. William, 14402
Richardson, Edward P., 14072
Romberg, Eli C., 14242
Shattuck, George C., 14042
Viets, Henry R., 14022
White, Paul D., 14221-2-3-4

The New England
Journal of Medicine

SUCCESSOR TO
THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

COMMITTEE ON PUBLICATIONS

HOMER GAGE, M.D. JOHN W. BARTOL, M.D.
ROGER I. LEE, M.D. ROBERT B. OSGOOD, M.D.
EDWARD W. TAYLOR, M.D.

EDITORIAL STAFF

DAVID L. EDSALL, M.D. STEPHEN RUSHMORE, M.D.
REID HUNT, M.D. HANS ZINSSER, M.D.
JOHN P. SUTHERLAND, M.D. BENJAMIN WHITE, PH.D.
GEORGE R. MINOT, M.D. HENRY R. VIETS, M.D.
FRANK H. LAHEY, M.D. ROBERT N. NYE, M.D.
SHIELDS WARREN, M.D.

WALTER P. BOWERS, M.D., *Managing Editor*

ASSOCIATE EDITORS

GEORGE G. SMITH, M.D. WILLIAM B. BREED, M.D.
JOSEPH GARLAND, M.D.

THE NEW HAMPSHIRE MEDICAL SOCIETY
PUBLICATION COMMITTEE

D. E. SULLIVAN, M.D. H. H. AMSDEN, M.D.
R. H. MARCOTTE, M.D.

THE VERMONT STATE MEDICAL SOCIETY
PUBLICATION COMMITTEE

WILLIAM G. RICKER, M.D. C. F. DALTON, M.D.
J. A. WARK, M.D.

SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.05 per year, $7.56 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 126 Massachusetts Avenue.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 126 Massachusetts Avenue, Boston, Mass.

FACTORS IN THE DECAY OF TEETH

AN interesting study of the factors concerned in the decay of the teeth has been made by Dr. Louise O. Kappas, Fellow in Pediatries of The Mayo Foundation, and reported in the *American Journal of Diseases of Children* (36:268, August, 1928). For this study two groups of Rochester school children were selected for comparison, twenty-five with perfect or nearly perfect teeth, and twenty-five with marked dental caries. The ages of the children ranged from 5 to 13 years, the average age in the first group being 9.5 years, and in the second group 6.1 years.

Prenatal factors were first inquired into and it was found that the health of the mothers of sixteen children in the first group and of eighteen of the second group was good, the difference being too small to be of significance. The diet of the mothers was found to be of more significance, green vegetables, fruits and milk predominating in the diet of fourteen of the mothers of the first group and of ten of the second group, whereas meat, potatoes and sweets predominated in the diet of six of the first group and ten of the second group.

Breast feeding seemed to be an unimportant factor, as eleven children in each group were breast-fed for more than nine months, and four in each group for less than one month. Cereal feedings were started before the age of nine months in eleven of the first group and in sixteen of the second group. Vegetables were regularly given before the age of one year to fourteen of each group. The members of both groups had received very little orange juice and cod liver oil.

After the age of one year, however, the diets varied greatly between the two groups, for it was found that green vegetables, fruit, meat and eggs predominated in the diet of thirteen of the children with good teeth, and in only three of those with poor teeth, whereas carbohydrates predominated in fourteen of those with poor teeth and in only three of those with good teeth. Fourteen of those with poor teeth and only two of those with good teeth ate much candy and sweets. More milk was drunk by members of the second group, and contrary to what might be expected, more of the second group than of the first group brushed their teeth regularly. Factors of heredity and of infectious disease incidence seemed of little importance; the important factor in preventing decay was apparently the diet of fruits and vegetables.

A group of fifty children is an exceedingly small one on which to base any very decided conclusions. Besides bearing out the general impression that a carbohydrate diet favors the growth of those mouth flora responsible for decay, however, this study also suggests in a striking manner that the diet is of more importance than the toothbrush. This is of special significance in view of the fact that the toothbrush is now being indicted in various quarters as a menace rather than an aid to oral hygiene, and certainly, as it is commonly used and cared for, the toothbrush can hardly be considered as a utensil of cleanliness.

NATIONAL COMMITTEE FOR MENTAL HYGIENE

PLANS for the First International Congress on Mental Hygiene to be held in Washington, D. C., in May, 1930, were formulated recently at the nineteenth annual meeting of the National Committee for Mental Hygiene in New York, funds sufficient to guarantee the basic expenses of the Congress having already been made available through the American Foundation for Mental Hygiene.

Since the war the mental hygiene movement has spread with great rapidity, national committees, leagues, councils or societies having

been established in twenty-one countries besides the United States and Canada. All the important countries are expected to be so represented by the time the First International Congress meets, and as a result of the Congress it is expected that an International Committee will be formed, with headquarters in this country. As Dr. Frankwood E. Williams, Medical Director of the National Committee said: "Much new knowledge of a fundamental sort and much experience in social procedure has been gained: We need to pool this knowledge; to equalize its distribution, that time and energy may not be expended in repetition of research or repetition of error in social planning; to reach if possible a consensus of opinion on certain fundamental matters; to learn where knowledge is yet too incomplete to make possible such agreement; to search out the next steps in the approach to a clearer understanding of the forces which go to make up "human nature" and to determine human relationships. An International Congress would contribute much to these ends."

In addition to the plans for an International Congress, the establishment of a new philanthropic foundation, known as The American Foundation for Mental Hygiene, Incorporated, was announced at the annual meeting of the National Committee for Mental Hygiene on November 8. Although this Foundation is without an endowment of its own, it is confident of receiving the funds necessary to carry out its purposes, and has already received a bequest of $50,000 and a conditional pledge of $100,000 toward its first million dollars of endowment. Dr. William H. Welch is Honorary President of the Foundation; Dr. Arthur H. Ruggles, President; James R. Angell, Rt. Rev. William Lawrence, D.D., and William L. Russell, M.D., Vice-Presidents; Frederic W. Allen, Treasurer, and Clifford W. Beers, Secretary.

It is very heartening in these days of emotional storm and stress, with the increasing complexities which life presents, to know that earnest and intelligent efforts are being made to come to a clearer understanding of human personality and the factors which influence it. The maladjustments of life are responsible for a vast deal of human unhappiness, and we often need help in shaping our courses so that our destinies may remain in our own hands.

THE ANNUAL REGISTRATION OF PHYSICIANS

THE adoption of the plan to require annual state registration of physicians has been adopted by a considerable number of states.

The main object has been to enable the Boards of Registration to have an up-to-date roster of practicing physicians. With most of the states the annual registration fee is large enough to supply a considerable surplus to the state treasury. It therefore appeals to legislatures as a revenue producing law.

Because of the added income the state is expected to engage in a more active prosecution of irregulars thereby conferring protection to those of its inhabitants who are imposed on by unscrupulous quacks.

The objections to this act will be voiced by doctors more than any other class because it is felt by them that they should not be taxed to provide for this protection but rather that the state should take upon itself more activity in suppressing fraud.

The existing requirements of practice involve, in addition to state registration in Massachusetts, local registration in the city or town where an office is maintained by a doctor, the narcotic and the liquor licenses, the filing of birth and death certificates and reports of communicable diseases. Doctors naturally do not want any further restrictions or taxes.

Testimony from states which have adopted this plan seems to show that irregulars have migrated to those states where such registration is not in force. New York State is reported to have benefited by this law.

Doctors as a class are known to be loyal supporters of plans which tend to promote public welfare and if they can be convinced that good will result will generally support any plan which will be effective and not unreasonable, but in the language of business if the idea is to be sold the profession must be convinced of its advantages.

This will require an educational campaign of some magnitude which should be carried on by the Board of Registration and the committees on legislation of the State Societies.

We suggest that criticism should be tempered with constructive advice because it should be recognized that the Board of Registration is not striving for added power but is actuated by a spirit of service. There is no more loyal and self-sacrificing body in the service of the State than this board. They have arduous and trying duties with inadequate remuneration and we believe earnestly desire to meet the wishes of the majority of the profession. This of course implies study of any given problem and well-considered conclusions.

If it is made plain that a definite reform is dependent on certain sacrifices by doctors the spirit of the profession will undoubtedly lead to the adoption of necessary laws.

In justice to the proponents of the plan this question of annual registration should be carefully and unselfishly considered.

It is planned to bring a representative from the Bureau of Education in New York early in January who will explain the operation of this law in that State.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

PALMER, ROBERT S. M.D. Harvard, 1925. Assistant in Medicine, Massachusetts General Hospital and Harvard Medical School. Address: 264 Beacon Street, Boston. Associated with him is:

WHITE, PAUL D. A.B., M.D. Harvard, 1911. Instructor in Medicine, Harvard Medical School. Associate Physician, Massachusetts General Hospital. Address: Massachusetts General Hospital, Boston. Their subject is "A Note on the Continuous Humming Murmur Heard in the Supra- and Infraclavicular Fossae and Over the Manubrium Sterni in Children." Page 1297.

CLIFTON, HARRY C. M.D. University of Pennsylvania School of Medicine, 1901. F.A.C.S. Attending Surgeon, St. Francis Hospital, Hartford. Consultant, Manchester Memorial, Bristol and New Britain Hospitals. Address: 30 Farmington Avenue, Hartford, Conn.
Associated with him is:

LANDRY, BENEDICT B. M.D. Harvard, 1920. F. A. C. S. Assistant Attending Surgeon, St. Francis Hospital and Municipal Hospitals, Hartford, Connecticut. Address: 30 Farmington Avenue, Hartford, Conn. Their subject is: "Anuria—Due to Pelvic Abscess." Page 1300.

DEKRUIF, MARY F. M.D. University of Michigan Medical School, 1916. Formerly Child Welfare Physician, Massachusetts State Department of Public Health. Her subject is: "A Study of 370 Deaths of Primiparae." Page 1302. Address: 34 Leighton Road, Wellesley, Mass.

MCCLURE, C. W. M.D. Ohio State University College of Medicine 1910. Member of Staff of Evans Memorial. In Charge of Gastrointestinal Division of Department of Biochemistry. Gastroenterologist to Out-Patient Department of Massachusetts Homeopathic Hospital. Address: 483 Beacon Street, Boston. Associated with him is:

HUNTSINGER, MILDRED E. B.S., Assistant in Biochemistry, Evans Memorial Hospital. Address: 6 Moulton Road, Arlington, Mass. Their subject is: "Paroxysmal Headache II." Page 1312.

GAMBLE, JAMES L. A.B., M.D. Harvard, 1910. Associate Professor of Pediatrics, Harvard, 1922. His subject is: "Acidosis and Alkalosis." Page 1318. Address: 33 Edge Hill Road, Brookline, Mass.

THE BOSTON MEDICAL LIBRARY

CAMPAIGN PROGRESS

WITH the fourth report meeting held Tuesday, December 18, active work suspended for the holiday period. Fifty physicians attended the meeting and reported contributions bringing the total to $91,516. Reports of interviews were highly encouraging. The percentage of refusals to contribute was low. In numerous cases consideration was postponed until the new year. The response of those to whom the cause has been personally presented demonstrates an interest and willingness to help that augurs well for success.

When it is remembered that, so far, the work of solicitation is being done entirely by busy physicians in such time as can be snatched from professional duties, it is not surprising that less than half the names selected by the enlisted workers have as yet been reported on. These men and women are rendering a service to the whole profession that merits grateful appreciation. It is impossible for them to see all who would be interested. A wider participation in the work of solicitation is much needed. The Campaign Chairman would be glad to hear from physicians in the Metropolitan area who are willing to present the united cause of the Medical Society and the Medical Library to a few persons. A hundred more workers would lighten the heavy load of those already enlisted, and would hasten final success.

Analysis of the records to date shows interesting features. Three hundred and fifty doctors have been seen. Of these, 298 have contributed $56,937, averaging $191. Twenty-six more have postponed decision of the amount they will contribute. Out of 308 laymen seen, 219 have given $34,489, averaging $157 each, and 33 have indicated that they will contribute later.

With favorable responses from 92% of all doctors seen, and 81% of laymen, the strength of the appeal is evident. The value of these two organizations to the community is recognized. Early in January the efforts will be resumed with increased enthusiasm and, it is hoped, an increased force of workers. Again the assistance of every member of the profession is earnestly requested.

VERMONT STATE MEDICAL SOCIETY

THE COUNTY MEDICAL SOCIETY

In reviewing the paper of Mr. J. G. Crownhart which was read at the November conference of the Secretaries of the State Medical Society, the *Pennsylvania Journal* reports as follows:

Under the caption, "A Number of Things," Mr. J. G. Crownhart, Madison, secretary of the State Medical Society of Wisconsin, stated that the county medical society is the backbone of the State Medical

Society; that the physician who is isolated should have a post-graduate scientific program brought to him; that an inactive secretary and inactive officers are ruinous to a county medical society; that an annual conference of the secretaries of county societies, at a time apart from the annual session of the State Society, is a great inspiration. The secretaries should bring their experiences to these conferences, and the state officers should remain in the background and allow the secretaries to handle the meeting. County society programs should not have a lack of material. At least one meeting a year should be a joint meeting with dentists. In order to devote more time to the scientific program, the county society should have a board of directors to whom all business should be referred. Better have four good meetings a year than eight poor ones.

In discussion, the following was emphasized: Readers of papers should deliver the goods. The presiding officer should hold the reader of a paper and those entering into the discussion to the time limit prescribed by the by-laws of the county medical society. In arranging a program, the subject matter should be of such nature that the members can use it in their practice. Barnstorming is not to be tolerated. A speaker who fails to appear kills a program, and some one, if possible, should be requested to fill the vacancy. A state society should render assistance to a county society in arranging its program. County societies may request medical schools to put on a program for them.

MISCELLANY

A STATEMENT SUBMITTED TO THE PRESS BY DR. GEORGE H. BIGELOW, COMMISSIONER OF HEALTH

Rabies

Seven hundred and twenty-six cases of dog bites in humans have been reported to this Department during October and November. Beginning the first of October because of the circumstances surrounding the last human death from this disease the Department required that all dog bites seen by a physician should be reported. Previous to this only dog bites which in the opinion of the physician required Pasteur treatment were reportable. This figure compares with the 63 dog bites reported for the same period last year when the more limited reporting was in force. At this present rate we should have reported by the end of a twelve-month period over 4000 human dog bites with 250 dogs proven by laboratory examination to be rabid.

Last winter the Division of Animal Industry of the Department of Conservation declared a ninety-day quarantine on the seventy cities and towns in and about the Metropolitan area. As no one remembers better than we, this was a complete fiasco due largely to lack of popular support based on sentimentality emanating largely from the city of Lynn. We are now constantly asked by persons who themselves or through their dogs have been exposed to the possibility of rabies what can be done to stop it. Our answer is this. The selectmen or mayor have authority to order restraint of dogs. As was pointed out, this is of no value unless adjacent communities co-öperate. This may be obtained by a meeting of selectmen or mayors. I should certainly advise the Division of Animal Industry under no circumstances to again declare a quarantine of the eastern part of the State where most of the disease is until such time as unequivocal popular support has been demonstrated. Neither the Division of Animal Industry nor this Department has sufficient staff or resources so enforcement must depend upon the local constabulary. As I see it, unless the police officer has actually had direct contact with the disease he is going to be just as effective as the public on his beat requires since there are plenty of other things which he may well consider more important to take up his time. Under our government of, by and for the people, the people have a way of getting just what they want and no more.

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

Boston, Mass.,
November 22, 1928.

Circular Letter No. 34.
Sent to Boards of Health in Massachusetts.

REPORTED DOG BITE

Dear Doctor:

Since the Department declared on September 18, 1928, dog bite reportable, several local boards of health and some physicians have raised certain questions in regard to this matter.

Obviously, dog bite is reportable by the physician to the local board of health. In this connection, bear in mind Section 28 of Chapter 129 of the General Laws, which reads in part as follows:

"The Board of Health of a town, any member or agent thereof, or any other person who has knowledge of or reason to suspect the existence of any contagious disease among domestic animals in the Commonwealth . . . . shall immediately give written notice thereof to the Director, or to an Inspector for the town where the animal is kept."

It therefore falls upon the board of health, when they have knowledge of such a situation described in this Section, to notify either the Director of Animal Industry or the Animal Inspector for the town where the animal is kept.

Department of Conservation Order No. 34, Section 3, reads as follows:

"All dogs known to have bitten persons shall be quarantined for a period of 14 days for observation, at the end of which period if no symptoms of rabies have developed said animals may be released from quarantine on order of the Director."

With this combination if the governmental agencies function as they should, there is no reasonable possibility of a *reported* dog bite escaping notice of the local board of health, the Director of the Division of Animal Industry, or an animal inspector of that Division, or this Department.

Very truly yours,

CLARENCE L. SCAMMAN, M.D.,
Director, Division of Communicable Diseases.

HEARINGS CONDUCTED BY THE BOARD OF REGISTRATION IN MEDICINE

On December 13, 1928 the Board of Registration in Medicine considered several complaints with respect to the behavior of physicians.

Dr. Walter D. Shurtleff was notified to appear to answer to a complaint alleging the performance of an illegal abortion. When the registered letter, call-

ing him before the Board was taken to his office no one was found to whom it could be delivered and the letter was returned with the report that the office was closed.

Dr. Shurtleff was before the Board several years ago but the woman who had made incriminating statements in the hospital to which she was taken changed her story and the Board did not feel warranted in taking action at that time, and could not act under the recent complaint in the absence of the doctor and without evidence of delivery of the notice.

Dr. Manford D. Spalding of Auburn was found guilty of using the designation "M.D." on his stationery whereas in fact his only degree entitling him to recognition was D.O. His explanation was labored and specious and did not convince the Board that he was honest in his contention that he did not intend to convey the impression that he is an M.D. His registration was suspended for one month.

Dr. George Hebert of Holyoke convicted and serving a sentence in jail because of having performed an illegal abortion was deprived of his right to practice in the State.

The other cases of lesser importance were placed on probation.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS, NOVEMBER, 1928

GENERAL PREVALENCE

The total reported incidence of communicable diseases for November was not unusual. Measles ran a high incidence for the month.

The reported incidence of anterior poliomyelitis, chickenpox, diphtheria, German measles, influenza, lobar pneumonia, mumps, pulmonary tuberculosis and scarlet fever was within endemic limits.

The reported incidence of non-pulmonary tuberculosis was low.

A new low November record was reached in the incidence of typhoid fever, twenty-three per cent. less cases being reported than in November, 1927.

RARE DISEASES

Anterior Poliomyelitis was reported from Arlington, 1; Boston, 2; Chicopee, 2; Lowell, 1; Lynn, 1; New Bedford, 2; Newburyport, 1; Newton, 1; Norwood, 1; Salem, 2; total, 14.

Anthrax was reported from Andover, 1; Lynn, 1; total, 2.

Dysentery was reported from Boston, 1; Chelsea, 1; Somerville, 1; total, 3.

Encephalitis lethargica was reported from Boston, 2; Brockton, 1; Danvers, 1; Pittsfield, 1; total, 5.

Epidemic cerebrospinal meningitis was reported from Boston, 2; Cambridge, 1; Chelsea, 2; Lynn, 1; Methuen, 1; Revere, 2; Springfield, 1; total, 10.

Pellagra was reported from Boston, 2; Northampton, 1; total, 3.

Septic sore throat was reported from Amesbury, 1; Greenfield, 1; Marblehead, 1; Merrimac, 1; Somerville, 1; Williamstown, 4; total, 9.

Smallpox was reported from Boston, 2; total, 2.

Tetanus was reported from Worcester, 1; total, 1.

Trachoma was reported from Boston 2; Cambridge, 1; Lowell, 1; total, 4.

MONTHLY REPORT OF CERTAIN COMMUNICABLE DISEASES.

DISEASE	Cases in Entire Population: Nov. 1928	Nov. 1927	Prosodemic Index	Epidemic Index	Case Rates per 100,000 Pop.: Nov. 1928	Nov. 1927	Expected Rate ***
ALL CAUSES	6257	6570	-	-	144.7	153.9	-
Ant. Poliomyelitis	14	146	35*	.4**	.3	3.4	.8
Diphtheria	359	542	631*	.6**	8.3	12.7	14.6
Measles	1620	1221	1293*	1.3**	37.4	28.6	29.9
Pneumonia, Lobar	237	324	331*	.7**	5.5	7.6	7.7
Scarlet Fever	769	968	841*	.9**	17.8	22.6	19.5
Tuberculosis, Pul.	367	383	284*	1.3**	8.5	9.0	6.6
Typhoid Fever	30	39	34*	.9**	.7	.9	.8
Whooping Cough	425	606	658*	.6**	9.8	14.2	15.2
Chicken Pox	935	958	-	-	21.6	22.4	-
German Measles	31	57	-	-	.7	1.3	-
Influenza	31	37	-	-	.7	.9	-
Mumps	232	402	-	-	5.4	9.4	-
Tuberculosis, O.P.	49	55	-	-	1.1	1.3	-

* This Index is an attempt to estimate the number of cases based on the trend during the past years which can be expected to occur, and is for the purpose of comparison with the number of cases which actually did occur.

** This ratio expresses how prevalent the disease is compared with the index mentioned above; 1.0 indicates that the actual number of cases equals the expected number. A larger number means a greater prevalence, and a smaller number a lesser prevalence than expected. Thus, 2.0 would indicate twice the expected number of cases, and .5 half the expected number of cases. The method used to determine the indices is described in the August 18, 1927 issue of the Boston Medical and Surgical Journal.

*** Calculated from the Prosodemic Index

PATIENTS IN STATE HOSPITALS FOR MENTAL DISEASE: 1927

CONNECTICUT

Preliminary Report

Washington, D. C., December 27, 1928.—The Department of Commerce makes the following announcement for the State of Connecticut concerning results of the 1927 census of mental patients in state hospitals.

The two hospitals in Connecticut had a total of 907 first admissions during the year 1927, as compared with 950 in 1926, and 918 in 1922.

These first admissions represent patients received during the year, who had not previously been under treatment in any hospital for mental disease. Such newly admitted patients afford the best available measure of the number of new cases of mental disease which are brought under hospital treatment during a given year.

The decrease in the number of first admissions to state hospitals in Connecticut between 1922 and 1927 represents a still larger decrease relative to the population of the State as shown by the fact that the first admissions in 1927 numbered 55.4 per 100,000 of population as compared with 62.8 in 1922.

The extent to which provision has been made for state treatment of mental patients is indicated by the number of patients present in the state hospitals on a given date. In Connecticut, the number of mental patients under treatment in the state hospitals has increased steadily from 3,069 on Jan. 1, 1910, to 4,916 on Jan. 1, 1928; and the ratio of such patients per 100,000 of general population increased from 274.4 on Jan. 1, 1910, to 297.4 on Jan. 1, 1928.

Of the first admissions in Connecticut during the year 1927, 527 were males and 380 were females; and of the patients present on Jan. 1, 1928, 2,407 were males and 2,509 were females.

RHODE ISLAND

Preliminary Report

Washington, D. C., December 14, 1928.—The Department of Commerce makes the following announcement for the State of Rhode Island concerning results of the 1927 census of mental patients in state hospitals.

The Rhode Island State Hospital for Mental Disease had a total of 376 first admissions during the year 1927, as compared with 391 in 1926, and 346 in 1922.

These first admissions represent patients received during the year, who had not previously been under treatment in any hospital for mental disease. Such newly admitted patients afford the best available measure of the number of new cases of mental disease which are brought under hospital treatment during a given year.

The increase in the number of first admissions to the state hospital in Rhode Island between 1922 and 1927 was relatively smaller than the growth in the State's population during the same period, as shown by the fact that the first admissions in 1927 numbered 53.4 per 100,000 of population as compared with 54.1 in 1922.

The extent to which provision has been made for state treatment of mental patients is indicated by the number of patients present in the state hospitals on a given date. In Rhode Island, the number of mental patients under treatment in the state hospital has increased steadily from 1,101 on Jan. 1, 1910 to 1,762 on Jan. 1, 1928; and the ratio of such patients per 100,000 of general population increased from 202.9 on January 1, 1910 to 247.8 on Jan. 1, 1928.

Of the first admissions in Rhode Island during the year 1927, 218 were males and 158 were females; and of the patients present on Jan. 1, 1928, 906 were males, and 856 were females.

These figures are based on reports furnished by the institution, through the co-öperation of the State Public Welfare Commission. The figures for 1927 and 1928 are preliminary and subject to correction.

TEAR GAS USED IN NEW FUMIGATION METHOD

In connection with the prevention of the introduction of quarantinable diseases into the United States, the Public Health Service maintains maritime quarantine stations at all the principal seaports in the United States and its possessions through which all ships from foreign ports must pass prior to entering the port. When ships arrive from foreign ports where quarantinable disease exists they usually are required to undergo fumigation for the destruction of rodents and insects which might convey infection.

In order to improve the efficacy of fumigation and to reduce the amount of ship's time required for proper fumigation, the Public Health Service is constantly devising new and improved methods in fumigation procedure.

A recent report issued by the Public Health Service deals with the latest experiments made in connection with the use of the poisonous cyanogen products in the fumigation of vessels. This report accentuates the advisability of using cyanogen products which include a sufficient amount of tear gas to serve as a warning agent.

The subject of ship fumigation is one of the greatest sanitary importance. Until a more efficient method for the eradication of potentially plague-infected rodents is devised and its dependability proved beyond reasonable doubt, fumigation will continue as the procedure of choice.—*Bulletin United States Public Health Service.*

FAMOUS BRITISH MEDICAL AUTHORITY CAUTIONS AMERICAN PUBLIC

WARNS AGAINST UNHYGIENIC EATING HABITS AND SUGGESTS REVISION OF AMERICAN DIET—RADIO MESSAGE TO REIDSVILLE, N. C., COMMISSIONER OF PUBLIC HEALTH

Warning the American people against unhygienic eating habits and suggesting a revision of the American diet, George F. Buchan, M.D., member of the Royal College of Physicians and one of Great Britain's leading sanitarians, who recently visited America as British representative at the American Public Health Association meeting in Chicago, sent a radio message from the "Baltic" on the high seas to S. G. Jett, M.D., Commissioner of Public Health of Reidsville, North Carolina, in answer to a request for a statement on public health.

Dr. Buchan is Doctor of Public Health (Cambridge), and ex-president of the British Association of Medical Officers of Health. He was made an honorary member of the American Public Health Association recently. His statement follows:

"I have just toured the states, investigating the public health conditions in America. I noticed that many people finished their meal with sweets. This is hygienically unsound as sweets stick to the crevices and get in between the teeth and lead to fermentation and dental decay.

"The correct way to finish a meal is with fruit, coffee and a cigarette. The fruit hardens the gums and cleans the teeth; the coffee stimulates the flow of saliva in the mouth and acts as a mouth wash; while finally the cigarette disinfects the mouth and soothes the nerves".—*Bulletin of City of Reidsville, N. C., Department of Public Health*, S. G. Jett, M.D., Commissioner.

UNITED STATES PUBLIC HEALTH SERVICE

Surgeon General Reviews World Health Conditions and Summarizes the Work of His Bureau in Annual Report

A summary of world health conditions and of the work of the United States Public Health Service is given in the annual report of Surgeon General H. S. Cumming just submitted to Congress.

On account of the close relation between modern commerce and the public health with respect to the spread of disease, the Public Health Service keeps informed of the world prevalence of dangerous communicable diseases and hold two most important lines of national defense against imported infections —examination of intending immigrants abroad in the country of origin and inspection of vessels, passengers, and seamen and the medical examination of alien passengers and seamen arriving at domestic and insular ports of the United States. As a result of this work, there was no importation of any quarantinable disease during the year, despite the fact that smallpox, plague, yellow fever, cholera, and typhus fever were more or less prevalent in endemic localities throughout the world.

In this work of protecting the United States from the importation of dangerous diseases, 21,631 vessels, 1,046,319 passengers, and 1,308,681 seamen were inspected at domestic and insular ports, and 1,178,482 alien passengers and 928,423 alien seamen were examined by medical officers under the immigration law. Seven cases of smallpox, one case of leprosy, and two cases of typhus fever reached the quarantine stations and were detained. Among the more important causes of certification for disease in alien passengers were trachoma, tuberculosis, feeblemindedness, insanity, and the venereal diseases, while the more important causes among alien seamen were the venereal diseases, trachoma, and tuberculosis.

The Surgeon General states that health conditions were generally favorable throughout the world during the fiscal year 1928. No pandemic outbreaks of any disease occurred and no country with a modern health organization was affected by the spread of any of the pestilences that have scourged the world in times past. Bubonic plague continued to be pandemic, India continuing to be the world center of plague prevalence. That the disease is widespread, however, is shown by the fact that cases were reported in French Indo-China, China, Algeria, Madagascar, Nigeria, Siam, Argentina, Ecuador, South Africa, Greece, and Russia. In spite of this world-wide occurrence, there were no cases on the North American continent, excepting two in California, which were contracted from the infection in ground squirrels in that State. These squirrels constitute a perpetual reservoir of plague infection.

Cholera was more prevalent in India than it had been during the preceding eight years, excepting 1924, and was present in several other parts of the world, principally Siam, Cochin-China, and China proper. Many Chinese ports were reported as infected during the year. An extensive epidemic of cholera also occurred in Irag.

Yellow fever reappeared in West Africa in June, 1928, after several months' absence. Some months earlier, cases had been reported at various places in Africa, including Senegal, Togoland, Dahomey, the Gold Coast, and the Belgian Congo. An epidemic of yellow fever developed at Rio de Janeiro Brazil, during 1928, and the disease was reported at several other ports and from places in the interior.

The typhus fever situation in Europe continued to improve, although a marked outbreak occurred in Morocco in the latter part of 1927 and early in 1928.

"Smallpox," says the Surgeon General, "continues to be unduly prevalent in spite of the fact that an efficacious method of prevention is known. The disease is reported from practically every country of the world." He points out that again the United States has the unenviable distinction of reporting more cases of smallpox during the year than any other country in the world from which reports are received, except India, and says:

"It is difficult to understand why this condition is allowed to continue year after year. A large percentage of the property in this country is insured against loss by fire, and a man who fails to provide for his family by taking out life insurance is censured; yet, when smallpox is introduced into a community in the United States it usually finds many victims who have never been vaccinated and others who have not been vaccinated for many years. Nearly 34,000 cases of smallpox in the United States in the calendar year 1927, testify to the neglect of the people to utilize vaccination."

A widespread outbreak of infantile paralysis occurred in the United States during the summer of 1927. The serious after-effects of this disease make it more to be dreaded than other diseases which cause many more cases of illness and even have a higher death rate. Attention is called to the importance of proper after-care in this disease.

Measles caused nearly 4,000 deaths in 41 States in 1927, a little more than half the number of deaths recorded for this disease in the preceding year. Measles is a disease that fluctuates widely from year to year. Whooping cough caused nearly 7,000 deaths in 42 States in 1927. and is, therefore, not the harmless disease it is generally considered.

An increase in the number of deaths from pellagra was reported in the lower Mississippi valley region, consequent upon unfavorable industrial and economic conditions following the flood.

The death rate for influenza and pneumonia was unusually low in the United States during the calendar year 1927, the decrease in these important causes of death having contributed materially to the low general death rate for the year.

For several years prior to 1921 the case and death rates for diphtheria had been rising; but from 1921 to 1926 there was an improvement in the diphtheria conditions, while there was increased prevalence again in 1927. The case rate had begun to drop again toward the end of the present fiscal year.

In addition to the prevention of the importation of disease and the prevention of epidemics in the United States, the United States Public Health Service is authorized by law to investigate diseases of man, and in this work it not only carries on research in the basic sciences of public health, but lends its efforts to the solution of problems of applied public health—the effective economic control of diseases.

Among the subjects of fundamental research were studies of cancer, tuberculosis, goiter, leprosy, trachoma, undulant fever, typhus fever, Rocky Mountain spotted fever, pneumonia, and the venereal diseases. These studies were carried on by workers connected with the Hygienic Laboratory of the Public Health Service, which has become recognized throughout the world by its scientific research work in public health. Special studies were also made throughout the year on health problems in industry, child hygiene and stream pollution.

In 150 ports of the United States, Alaska, and the insular possessions, hospital and out-patient treatment was furnished during the year by the U. S. Public Health Service to American merchant seamen and other legal beneficiaries to the extent of 1,354,545 patient days in hospital and 638,794 out-patient treatments. A total of 349,199 persons applied for medical service. It is an interesting commentary on the incidence and cost of venereal diseases to note in the report that these diseases comprised 18.7 per cent. of the total admissions and were hospitalized at a cost of $812,096.

The personnel of the Public Health Service, consisting of a corps of medical and dental officers, sanitary engineers, pharmacists, nurses, specialists and other technical and non-technical employees, at midyear 1928 consisted of 1,174 medical officers and persons of other scientific ratings, and 3,586 general and technical employees.

NOISE

Recently a private nurse was overheard to say to another private nurse, "Oh, this noise is just terrible; it keeps my patient awake all the time!" And what had she done about it? Nothing. If water was trickling in on the bed, we would have heard about it! If the food had been ice cold, we would have heard about it! If the water had been dirty, we would have heard about it! But noise—which undoubtedly was much more harmful to the patient than any of these other things, seemed to be of no real concern of hers except to put up with it and allow her patient to be disturbed. The hospital feels that every nurse connected with the hospital should feel especially constituted a committee of one to check every sound she hears, and that it is her business to see that no unnecessary sounds are made. We have too much noise. To stop it everyone must take part in helping to check it. Feel that it is your responsibility. If a doctor is noisy, tell him! If a nurse is noisy, tell her! If visitors are noisy, go into the next room and tell them! If orderlies are noisy, tell them! Unnecessary noise is probably always forgetfulness, and everyone will probably appreciate being reminded.—*Bulletin of the Queen's Hospital.*

MASSACHUSETTS LEGISLATIVE NOTES

1929

SPECIAL REPORT OF DEPARTMENT OF PUBLIC UTILITIES (ON SMOKE ABATEMENT)

To the Honorable Senate and House of Representatives:

Section 2 of chapter 301 of the Acts of 1928 provides as follows:

The department of public utilities is hereby directed to further consider ways and means for more effectively abating the smoke nuisance in the district described in the preceding section so far as is consistent with the reasonable requirements of fuel consumers, and to make a report of its findings and recommendations to the general court, together with drafts of legislation necessary to effect the same, by filing the same with the clerk of the house of representatives not later than December first of the current year.

The district referred to is a district established by section one of the act by adding to the district established by section one of chapter six hundred and fifty-one of the acts of nineteen hundred and ten so that the district as now constituted includes the cities and towns of Arlington, Belmont, Boston, Braintree, Brookline, Cambridge, Canton, Chelsea, Dedham, Everett, Lynn, Malden, Medford, Melrose, Milton, Needham, Newton, Quincy, Revere, Saugus, Somerville, Stoneham, Wakefield, Waltham, Watertown, Weymouth, Winchester, Winthrop and Woburn. In our report to the Legislature of last year we recommended changes in the laws relative to the abatement of smoke which would apply throughout the commonwealth if accepted by any city or town outside of the district established in 1910. Said section 2 directs us to consider ways and means for more effectively abating the smoke nuisance in the district, and we confine our report to that alone.

We have held a public hearing upon the subject matter referred to us and have further considered ways and means for more effectively abating the smoke nuisance in the district and submit the following report.

As we pointed out in our report of last year, chapter six hundred and fifty-one of the acts of nineteen hundred and ten, now applicable to the district, divides all stacks, other than marine and locomotive stacks, into three classes. The first class consists of all stacks having an area at the top equalling the area of a five-foot circle or less, the second class includes those stacks where the area at the top exceeds the area of a five-foot circle but does not exceed the area of a ten-foot circle, and the third class includes all stacks having an area at the top exceeding the area of a ten-foot circle. The classes are denominated Class I, Class II and Class III, respectively.

The Act provides that the stacks of Class I should not emit for more than six minutes in any one hour smoke of a density equal to, or greater than, that of

No. 2 in the Ringelmann Smoke Chart as heretofore published and used by the United States Geological Survey. Apparently at the time of the passage of the Act it was felt that the larger stacks might have difficulty in meeting this standard, and so it was provided that stacks of Class II should not emit smoke of a density of No. 3, or greater, for more than three minutes in an hour, allowing them to discharge at any and all times smoke of a density less than No. 3 of the Chart. As to Class III stacks, it was provided that they might emit smoke of a density equal to No. 2 of the Chart, or greater, for 25 minutes in each hour, provided they did not emit smoke of a density of No. 3 of the Chart, or greater, for more than five minutes in the 25 minutes. It will be observed that the treatment of Class II stacks was more liberal than that obtaining to Class III stacks, in that for 35 minutes in the hour the emission of smoke from stacks of Class III of a density of No. 2 of the Chart, or greater, was prohibited, whereas in the case of stacks of Class II smoke might be emitted all the time of a density equal to or greater than that of No. 2 of the Chart, provided it did not equal or exceed that of No. 3 of the Chart for more than three minutes. The reason for this distinction is not to us apparent, unless the framers of the Act had in mind that stacks of Class II would be in use in plants where stoking of the fires was by hand, while stacks of Class III would be used in connection with plants where the stoking was by machinery.

Experience has demonstrated that plants where stacks of Class II and Class III are used have little or no difficulty in keeping the density of smoke emitted from the stacks below that of No. 2 of the Chart except at times when fire boxes are being cleaned out or new fires are built therein. Plants with stacks of Class III are now required to keep the density of the smoke below that of No. 2 for 35 minutes of each hour. We see no reason why they cannot do that which they now do for 35 minutes in the hour for the rest of the hour, if reasonable time is given for the cleaning out of the fire boxes or for starting a new fire therein. What is true of Class III stacks is true, we believe, of Class II stacks. Where the plant is hand-stoked all that is required is reasonable intelligence in stoking the fires, and where the plant is operated by oil, proper installation maintenance and operation of the plant and the burning of a grade of oil adapted to it.

It was argued at the legislative hearing last year by experts representing objectors to the proposed legislation that because of the size of the larger stacks, plants where such stacks were used could not comply with the standard now applicable to Class I stacks. This argument is disposed of, we believe, by what we have said before in relation to the operation of the plants with the larger stacks being able to keep the density of the smoke below that of No. 2 of the Chart, except where fire boxes are being cleaned out or new fires built therein. The experts also contended that smoke of a less density than No. 2 may appear to be that of No. 2 or greater because of the distance through the column of the smoke. Moreover, experience has shown that plants where such stacks are used are now in fact operated so that the smoke emitted from the stacks appears from observation to be of a less density than that of No. 2 of the Chart. Moreover, if there is anything of substance in this contention, it is one that may be raised in court, as to whether in fact there has been a violation.

Marine stacks are divided into two classes which, under the Act, are denominated Class IV and Class V. Class IV includes all stacks whose top area is equal to a four-foot circle or less, while Class V includes all stacks of a larger top area. The emission of smoke from stacks of Class IV is limited to smoke of a density of No. 3 of the Chart or greater for a period of three minutes in any hour, while smoke may be emitted from the stack of a density up to No. 3 of the Chart at all times. Stacks included in Class V are limited to the discharge of smoke of a density equal to No. 3 of the Chart, or greater, for five minutes in an hour, and they may emit smoke at all times up to No. 3 of the Chart. We know of no reason why what we have said above as to stacks of Classes I, II and III should not apply to the marine stacks, and we believe there would be no difficulty in complying with the standard now applicable to Class I stacks.

In our report to the Legislature last year we recommended that one standard be created for all stacks other than locomotive stacks (House No. 900 of 1928), and that this standard should prohibit the emission of smoke of a darkness or density equal to No. 2 of the Ringelmann Smoke Chart for a period of more than six minutes in any hour, with provision that during such six minutes, for a period of not more than two minutes, smoke of a density equal to No. 3 of the Ringelmann Smoke Chart, or greater, might be discharged. We believe that such a standard was, in substance, that now applicable to stacks of Class I. The provision that only for a period of two minutes within the six minutes could smoke of a density equal to No. 3 of the Ringelmann Smoke Chart, or greater, be discharged, met with vigorous opposition at the hearing, and it was contended by many that it was a standard which could not be met. We believe that the provision that smoke of a density equal to No. 3 or greater should not be discharged for more than two minutes during the six is not of sufficient importance to stand in the way of obtaining a standard, applicable to all stacks, such as now pertains to stacks of Class I. If the emission of smoke of a density equal to No. 2 or greater of the Chart is restricted to six minutes in any hour, it is probable that smoke of a density equal to No. 3 or greater will not be emitted for periods much in excess of two minutes in any hour. As a consequence, we recommend that the standard now applicable to stacks falling within Class I be made applicable to all stacks other than locomotive stacks. This stand would be substantially the same as that obtaining in Indianapolis and would be less severe than that now obtaining in New York. It would be simpler in administration than the present standard and would apply to all alike.

In our report last year we stated that 'We do not deem it wise at the present time to attempt to deal with the control of soot and cinders emitted from chimneys other than as they may be involved in the emission of smoke. While it is true that there are devices for the elimination of cinders, none other than those of a very expensive type have been, as a general rule efficient and we believe it would be impracticable to enforce their use except in the case of very large plants. Any provision for their general use, in our judgment, would impose too

great a burden upon the public! We see no reason for changing our views as therein expressed.

The provisions of chapter six hundred and fifty-one of the acts of nineteen hundred and ten, relating to smoke from locomotive engines, were amended by chapter fifty of the acts of nineteen hundred and fifteen. We do not believe that any substantial change in the law with respect to such smoke is advisable, and in our draft of a bill we leave these provisions substantially as they now are.

We renew our recommendations of last year as to a change in the penalty for violation of the terms of the Act and for a remedy in equity afforded owners or tenants of real estate located within one-half mile of the source of the nuisance.

We herewith submit a bill, marked "A", to carry out the suggestions herein made, and we recommend its adoption.

HENRY C. ATTWILL
EVERETT E. STONE
HENRY G. WELLS
LEONARD F. HARDY
LEWIS GOLDBERG.

AN ACT relative to the emission of smoke in the city of Boston and vicinity.

Section 1. Chapter six hundred and fifty-one of the acts of nineteen hundred and ten, as amended by chapter ten of the acts of nineteen hundred and eleven, and as further amended by chapter fifty of the acts of nineteen hundred and fifteen, and by chapter three hundred and one of the acts of nineteen hundred and twenty-eight, is hereby further amended by striking out sections one and two and inserting in place thereof the following:—

Section 1. In this act unless the context otherwise requires:

"Board" means the department of public utilities.

"District" means the district to which the provisions of this act shall apply, to wit:—That part of Boston harbor lying westerly of a line drawn from the southeastern point of Deer Island to the northeastern point of Long Island and the territory comprised within the cities and towns of Arlington, Belmont, Boston, Braintree, Brookline, Cambridge, Canton, Chelsea, Dedham, Everett, Lynn, Malden, Medford, Melrose, Milton, Needham, Newton, Quincy, Revere, Saugus, Somerville, Stoneham, Wakefield, Waltham, Watertown, Weymouth, Winchester, Winthrop and Woburn.

Section 2. The emission of smoke in the district, except by locomotive engines in the open air of a darkness or density equal to or greater than number two of the Ringelmann Smoke Chart, as heretofore published and used by the United States Geological Survey, for an aggregate of more than six minutes in any hour is hereby declared a nuisance.

Section 2A. An owner or tenant of real estate located within one half mile of the source of the nuisance defined in section two who suffers damage to his person or property thereby or whose family suffers such damage may apply to the superior court for an injunction to restrain the commission or maintenance of such nuisance and the court may, by appropriate order, after hearing the parties, enjoin the commission or maintenance of such nuisance or make any other appropriate order to abate such nuisance

Section 2B. Whoever permits or suffers the emission of smoke from a locomotive engine owned or operated by him of a darkness or density equal to or greater than number three of the Ringelmann Smoke Chart, as heretofore published and used by the United States Geological Survey, for an aggregate of more than thirty seconds in any five-minute period shall be punished by a fine of not more than five hundred dollars or by imprisonment for not more than three months or by both such fine and imprisonment; provided that, while such engine is in and about a round-house and a fire is being built or rebuilt therein, such smoke may be emitted for a period of not more than fifteen minutes in the aggregate.

Section 2. Section six of said chapter six hundred and fifty-one is hereby amended by inserting after the word "stack" in the third line the words:—or chimney,—and by striking out the last sentence,—so as to read as follows:—

Section 6. The board shall have power, after notice and a hearing, to order any person or corporation having control of a stack or chimney, other than an employee, to stop or abate the emission of smoke in the district in violation of this act. Such notice shall be in writing and may be served personally upon such person or corporation, or duly authorized agent by any person authorized by the board to make such service, and in the manner provided by the laws of the commonwealth for the service of writs returnable to the superior court. Such notice shall be served at least forty-eight hours before the time fixed for the hearing, and a copy of the order or decree of the board shall in like manner be served upon such person or corporation or duly authorized agent within twenty-four hours after the same shall be made by the board.

Section 3. Said chapter six hundred and fifty-one is further amended by striking out section seven and inserting in place thereof the following new sections:—

Section 7. Any person or corporation violating any order of the board shall be guilty of a misdemeanor and shall be punished by a fine of not more than five hundred dollars or by imprisonment of not more than three months or by both such fine and imprisonment.

Section 7A. The superior court sitting in equity, on the petition of the board, shall have jurisdiction to restrain violations of this act.

CORRESPONDENCE

THE ANNUAL REGISTRATION OF PHYSICIANS

Mr. Editor:

It is rather interesting to note that while all but one of the members of the Middlesex East district according to a statement in the JOURNAL of Dec. 13th voted against annual registration of all physicians the members of the Worcester District at a largely attended meeting voted unanimously for it. "Many men of many minds"? SAMUEL B. WOODWARD.

Worcester,
Dec. 17, '28.

Editor,
NEW ENGLAND JOURNAL OF MEDICINE,
Boston, Mass.
Dear Sir:

It has come to my attention that a bill has been proposed, the object of which is to provide for the annual registration of physicians in this Commonwealth.

Physicians are now burdened with too many regulations, some of them being absolutely necessary, while others are unnecessary. With so many annual registrations, the physician will soon be compelled to spend his time with bookkeeping, correspondence, and law reading, and if he has time left, he will need that for sleep. I have been following closely the various new rules and regulations that have been put into effect for the benefit of the public, and have found that the physician does a great deal of work to protect the public without any compensation. Other public servants who protect the public are compensated for their work, i.e., policemen, firemen, public health officers and inspectors, sealers of weights and measures, city solicitors, constables, etc., while the physician who is compelled to report cases of infectious diseases, cases of gun shot wounds, take cultures, keep records of narcotics dispensed or prescribed, etc., etc., is not paid for such work.

The physician has paid for his education from his own bank roll. He has obtained his license to practice only after a proper examination based upon his knowledge of medicine and surgery, and he is guaranteed a livelihood perhaps only after a dozen years in the practice of medicine. I think that the physician ought to be paid for every bit of work that he does that insures the health of the people, the same as is being paid to the health officers of every city and town in this wonderful state of Massachusetts. A fee of twenty-five cents is paid to every doctor who reports a case (Worcester) of birth to the city clerk. Why not pay every doctor who reports a case of infectious disease to the public health authorities? Did not this doctor learn how to diagnose infectious diseases at his own expense? I cannot understand why the state wishes the physicians to report diseases detrimental to public health without compensating them, any more than a citizen would be compelled to report a defect in a public sidewalk, which might be the cause of an injury to a pedestrian, or for an automobile driver to be compelled to report to the police, a defect in the public highway. Police get paid for their work which includes the reporting of imperfections of streets, roads, lights, etc., while we physicians do a lot of work for nothing.

We have too many laws now that are never enforced. Every year many new ones are added, and if we only enforced those that are now in force, we would have an ideal state.

With a large number of hospitals, dispensaries, clinics, district nurses, society doctors, etc., the physician finds it difficult to become a millionaire. Every layman thinks that the doctor is a millionaire in disguise; that the doctor ought to pay a little more than the laborer, who gets more "real" money for his work than the average doctor gets today. A doctor who does work in a hospital or clinic gratuitously, is considered to be well repaid for his labors, because of the experience that he obtains. Every person who follows every other line of endeavor also obtains experience in it, but who would think of having an electrician or plumber work for nothing, just because he is getting the experience! A new policeman or a new fireman who knows nothing about police work or fire fighting respectively, receives his pay from the very first day that he is appointed, while the doctor who must be registered in order to become gratified to trust "deadbeats" wonders why the world is so full of inconsistencies. Who ever heard of a city solicitor, court clerk, judge, public prosecutor or a dog catcher working for nothing, as does the doctor in a hospital, clinic, dispensary or out-patient department!

A doctor's name is listed in every directory, telephone book, and what not. Beggars are frequent visitors to their offices. Solicitors from every source seek aid for some club, society, organization or charitable institution. If the doctor gave a donation to all those who asked for assistance, he would be compelled to sell his nightshirt. He is fortunate if he is able to practice that which he preaches;—sleep eight hours a day; take a daily walk; ride a bicycle or keep worry away. He does not need drugs or an alarm clock to waken him.

The present law regarding the registration of physicians is all right. Every time a change is made it means the expenditure of more money belonging to the Commonwealth. Every time a new Board is instituted, it necessitates a set of new members who must get paid. The State House will soon be too small if we keep on adding Board and Boards. It is now an easy matter for any person to learn just which man or woman who advertises himself or herself to be a physician, or as the law reads: "any person who holds himself out to be a physician"; has actually obtained proper registration. It has never been a trick to discover who is legally registered to practice medicine in this glorious Commonwealth. Why should it be such a difficult problem from now on? A sign in front of 141 East Central Street, Worcester, Mass., reads: "Dr. M. Baff." A person who passes desires to know if that man is a duly registered physician. It is not a Chinese puzzle to learn that fact. All that is necessary is to go to the City Hall at Worcester and ask the City Clerk, or to telephone or write to the State Board of Registation in Medicine at the State House, Boston, Mass. A few years ago a law compelled every physician, both old and new to register with the City or Town Clerk at a fee of twenty-five cents. That is sufficient security for those who may doubt a physician's right to practice in any city or town. America's greatest institution is the civil service. Once appointed, the applicant remains in a position for life with no re-registration, regurgitation or re-red-tape-ization. Let us follow Uncle Sam's example. He is the best uncle we ever had. Long Live the Commonwealth of Massachusetts! We don't make much money, and we don't have a good time. Dignity and ethics are ours, but they are not edible.

Very truly yours,

MAX BAFF, M.D.

(A Fellow of the Massachusetts Medical Society since 1903).

Dec. 18, 1928.

RECENT DEATH

HITCHCOCK — DR. JOHN SAWYER HITCHCOCK, a former Fellow of the Massachusetts Medical Society, living in Northampton, died at his home in Proffit, Virginia, Dec. 14, 1928, aged 59.

A grandson of Dr. Edward Hitchcock, president of Amherst College, he was born in Amherst, Aug. 10, 1869, and had resided in Northampton until he removed to Virginia in 1919. He was a graduate of the

University of Maryland School of Medicine and College of Physicians and Surgeons in 1893 and settled in Northampton two years later, joining the state medical society. He served on the State Board of Health from 1910 to 1918 as a district health officer and State Board of Health inspector and later director of the Division of Communicable Diseases.

He is survived by his widow and two children, John S. Hitchcock, Jr., and Miss Margaret Randolph Hitchcock.

OBITUARY

GEORGE A. FELCH

George A. Felch died suddenly Nov. 22, 1928, at his home, 68 Lowell avenue, Watertown. In apparent good health he had, that evening, attended a medical meeting.

He was born Feb. 10, 1890 in Ayer, Mass., the son of George E. Felch and the late Nellie Fuzzard Felch.

He attended the public schools and graduated from the high school in 1907. In 1909 he entered Tufts College Medical School receiving his degree Cum Laude 1913.

He then received his interneship at the Lowell Corporation Hospital; he started practice in Somerville staying there but a few months then coming to Boston where he practiced until his death. In 1917 he decided to join the army. He took the examination for a Commission in the Medical Corps but was rejected for physical disability. In September of the same year he was sent to Camp Devens and was again rejected and discharged.

His desire for service led him to again try for a commission in June, 1918. He was accepted and called into service July 6, 1918. His first assignment was at Hoffman Island, N. Y. Harbor. Later he was transferred to U. S. Debarkation Hospital, Nov. 5, New York City, and was discharged from the service June, 1919.

In 1917 he married Miss Janey Little of Amesbury—at Boston.

He had been a Fellow of the Massachusetts Medical Society since 1913 and a junior medical officer at the Boston Dispensary since 1925.

The funeral services were held at the Church of the Good Shepherd (Episcopal), Watertown, and Dr. Felch was buried in Ayer.

He is survived by his wife and two daughters, Barbara aged nine and Genevieve aged seven, his father, a brother and a sister.

NOTICES

BRONCHOSCOPY

The Graduate School of Medicine of the University of Pennsylvania begs to announce to the medical profession that with the opening of the newly built and equipped Chevalier Jackson Bronchoscopic Clinic of the Graduate Hospital of the University of Pennsylvania, it is even better prepared than previously to continue the teaching of peroral endoscopy. This newest of Bronchoscopic Clinics, which has been designed by Dr. Jackson for his personal work, is a model headquarters for such work, as conducted by Dr. Jackson and his associated staff in the Bronchoscopic Clinics of the two large teaching hospitals of the University of Pennsylvania (University and Graduate Hospitals). The non-clinical portion of the teaching is done in the anatomic and research surgical laboratories of the University. The total of the teaching facilities thus provided: personnel, clinical equipment and material, and laboratory equipment and material, are believed by the University to be ideal for the purpose.

Such teaching and related research constitutes a portion of the long courses, one to three years' duration, provided by the Graduate School of Medicine of the University of Pennsylvania, for physicians who pursue studies in the whole field of otolaryngology.

The Graduate School of Medicine, however, has also taken the utmost care in providing a series of two weeks' intensive studies designed for otolaryngologists and surgeons who desire to profit by the best contact with Dr. Jackson and his associates in courses for specialists. This circular particularly concerns such courses.

TWO WEEKS' COURSES IN LARYNGOSCOPY, BRONCHOSCOPY AND ESOPHAGOSCOPY FOR SPECIALISTS

Future dates for such courses, so far as now fixed, are: January 28 to February 9, February 25 to March 9, April 8 to April 20, August 5 to August 17, November 4 to November 16, and December 9 to December 21, 1929; January 27 to February 8, February 24 to March 8, and April 7 to April 19, 1930.

The courses include about six hours daily of intensive study, consisting of lectures, lantern and drawing demonstrations; endoscopic clinics; practice, in the technic, upon cadavers and dogs. Topics discussed are: uses, dangers, indications and contraindications in peroral endoscopy; diagnosis of foreign bodies in the air and food passages; the solution of the mechanical problems offered by various types of foreign bodies; bronchoscopy in diseases of the lungs; and bronchoscopy as an aid to the internist and the thoracic surgeon.

The courses are limited to twelve registrants (no one should come to Philadelphia for these courses without having first secured registration by correspondence).

Those qualified and desiring registration should address communication: "Dean, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa."

UNITED STATES CIVIL SERVICE EXAMINATIONS

The United States Civil Service Commission announces the following open competitive examinations:

Toxicologist, $3,800 to $4,400 a year
Associate Toxicologist, $3,200 to $3,700 a year
Assistant Toxicologist, $2,600 to $3,100 a year

Applications for the above-named positions must be on file with the Civil Service Commission at Washington, D. C., not later than January 23.

REPORTS AND NOTICES OF MEETINGS

THE MASSACHUSETTS PSYCHIATRIC SOCIETY

A meeting of the Massachusetts Psychiatric Society was held at the Boston Psychopathic Hospi-

tal December 14, 1928, and was attended by about one hundred members and guests.

In a paper entitled "Newer Aspects of the Problem of Mental Deficiency," Dr. Neil A. Dayton, Director of the Division of Mental Deficiency of the Massachusetts Department of Mental Diseases, reviewed the situation in reference to the number of mental defectives in Massachusetts. Admissions to the Walter E. Fernald, Wrentham, and Belchertown State Schools have increased sixty per cent. and the cases under care have increased two hundred seventy per cent., over the past twenty year period. The psychiatric examinations of retarded school children totalled thirty-two thousand at the end of 1927 and study of this material raises the estimate of mental defect in the population from two to five per cent. The numbers of known mental defectives increased from two thousand in 1907 to twenty-five thousand in 1927.

Dr. Dayton reported that the recent research of the Department of Mental Diseases in Mental Deficiency revealed a positive association between over-average height and weight and high intelligence and likewise a positive association between the same physical factors and high school accomplishment. Various physical defects, notably skeletal and neurological defects or diseases were associated positively with low intelligence.

Dr. Winfred Overholser, Director of the Division for the Examination of Prisoners of the Massachusetts Department of Mental Diseases, speaking on "Psychiatry and the Massachusetts Courts as now Related", outlined the history of the use of psychiatry as an adjunct to the criminal courts. Several courts have established their own clinics, and in addition all courts are at liberty to call upon the Department of Mental Diseases for advice and assistance.

The commitment of doubtful cases for observation is a simple procedure which is used to a considerable degree. If the patient recovers, he is returned to the court for disposition. In an acquittal for homicide by reason of insanity a life commitment is mandatory; this provision prevents such unfortunate happenings as the recent release of Remus from a state hospital in Ohio after such acquittal.

Another very constructive activity is illustrated by the "Briggs Law", providing for the examination by the Department of Mental Diseases of certain persons held for trial. The routine feature of this law and the impartial status of the examiners have combined to eliminate combats of experts in this State. Of the five hundred sixty-one persons so far examined under this law, one hundred twenty-one (twenty-one and one-half per cent.) have been found to be clearly abnormal mentally or in such condition that observation commitment was desirable. Massachusetts is held up as an example to the other states in this regard, and in several states this coming year attempts are to be made to enact a similar law.

HAMPSHIRE DISTRICT MEDICAL SOCIETY

The Quarterly meeting of the Hampshire District Medical Society was held Wednesday, December 12, at 11 A. M. The speakers were Dr. John W. Bartol and Mr. Frederic H. Kent on the Drive for the Medical Library and the Massachusetts Medical Society. The address of the day "The Relationship of the General Practitioner with the Surgeon in the Treatment of Ulcer of the Stomach and Duodenum" was presented by Dr. Philemon Truesdale of Fall River.

This was a meeting of great interest.

FRANCIS E. O'BRIEN, *President.*
LUTHER O. WHITMAN, *Secretary.*

WORCESTER DISTRICT MEDICAL SOCIETY

The December meeting of the Worcester District Medical Society was held at the Chamber of Commerce on Wednesday, December 12, 1928.

Vice President A. M. Shattuck presided at a short business meeting held at six thirty P. M.

At seven o'clock, Dr. Shattuck introduced Dr. Bancroft.

After the dinner, Dr. Shattuck introduced Dr. Quinby and Mr. Kent of Boston, both of whom gave an outline of the campaign of the Boston Medical Library and the Massachusetts Medical Society for a new building. This campaign is now in progress and all members of the Society were urged to coöperate with the committee.

Dr. John Homans of the Peter Bent Brigham Hospital in Boston was then presented as the speaker of the evening. Dr. Homans's subject was "Theory and Practice in the Treatment of Varicose Veins and Ulcer."

Dr. Homans is one of the few outstanding surgeons who has devoted a great deal of time and study to this subject. He explained the use of various alkaline solutions which are used intravenously to produce sclerosis.

Dr. Homans believes that radical resection of the ulcer with subsequent skin graft produces the most satisfactory and permanent result.

As to treatment of varicose veins, Dr. Homans advocates high legation and removal of the valveless veins. Expert bandaging occasionally will prove satisfactory in a few selected cases.

Drs. E. L. Hunt, E. H. Trowbridge, A. W. Marsh, J. W. O'Meara and Donald Adams took part in the interesting discussion of this paper.

The meeting was adjourned at ten P. M.

E. A. FIPPHEN, *Reporter.*

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society to celebrate the bicentenary of the birth of John Hunter was held in the Peter Bent Brigham Hospital Amphitheatre on the evening of Dec. 11, 1928.

Dr. Harvey Cushing opened the discussion. The past year has been the anniversary of three important milestones in the history of medicine. Three hundred years ago Harvey published his memorable treatise on the circulation of the blood. Malpighi was born in the same year. One hundred years later than that John Hunter was born in a small village near Glasgow, Scotland. Having an insatiable desire for the truth of Nature and abominating all set schooling, he was looked upon as a good-for-nothing. At the age of twenty he went to London to his brother's anatomy school, which marked the turning point in his career.

His first great work was on the human teeth. Published in two volumes, the sale of the first one went to pay his wedding expenses. Dr. Leroy Miner, Dean of the Harvard Dental School, quoted from the book to show that Hunter was the first to point out

the physiological and pathological relation of the teeth to the body.

Hunter's next great work was on venereal disease. This was presented by Dr. W. P. Coues, who pointed out that Hunter was a urologist a hundred and fifty years ahead of his time. Supposing gonorrhea and lues to be caused by the same virus, Hunter inoculated himself with lues and delayed treatment to follow the course of the disease. This was the great tragedy, for he died of the further developments of the disease.

The third of Hunter's great works was entitled "A Study of the Blood, Inflammation, and Gunshot Wounds." Dr. Arlie Bock quoted from the book at length, showing Hunter's conclusions which while erroneous in part showed the results of a keen power of observation. Hunter concluded from his studies that not the "red globules" but the "coagulable lymph" was the important constituent of the circulating blood.

Hunter was also an embryologist. Dr. F. T. Lewis showed several of Hunter's beautiful drawings of the goose embryo. Due to his lack of reading Hunter made several discoveries which Malpighi had already found. His experiments were interesting, however, and several times he was on the brink of great discoveries which if followed out would have definitely made of him a "father of embryology."

Besides being an anatomist, surgeon, and embryologist Hunter was a great naturalist. He wrote many treatises on natural history subjects, the greatest being that on the English bee. Professor W. M. Wheeler presented this part of the program in an interesting way.

To make the interest of the meeting more real Dr. Henry Viets had made an exhibit of books and manuscripts by John Hunter which was exceedingly entertaining. The impression one carried from the meeting was that John Hunter was a man of keen observation, rare discernment, and profound industry, handicapped by the scientific limitations of his time, yet thinking and doing things many years in advance of the age in which he worked.

HARVARD MEDICAL SOCIETY

A meeting of the Harvard Medical Society was held in the Peter Bent Brigham Hospital Amphitheatre on Tuesday, December 18, 1928. After the presentation of cases Dr. Elliott Joslin introduced Dr. Francis G. Benedict, Director of the Carnegie Nutrition Laboratory in Boston, who spoke on "The Respiratory Quotient and its Significance."

The first case was presented by Dr. Engelboch of the medical service. The patient was a 13 year old school girl with a history of several childhood diseases. She entered the O. P. D. complaining of loss of weight and a rundown condition of two months' duration. She gave a history of slight cough with little sputum and no hemoptysis, night sweats, and some pains in lower right chest on walking. She had been nervous, without energy, had a poor appetite, and had vomited frequently, mostly after supper. Her menses were irregular after being regular. Her temperature was 97 and pulse 76, blood pressure 100/60, normal urinalysis. Physical examination revealed constant crepitant râles at left apex after cough with some dulness and decreased tactile fremitus. X-ray was normal. She continued to lose weight and was admitted to the house on December 10th. In the house the râles at the apices were not heard. The B. M. R. taken in the O. P. D. and in the house was —28 and —35. There was some dryness of the skin and a little cyanosis of the hands. She was given 30 mgms. of thyroid extract daily. Two further B. N. R. tests taken a week later were —32 and —31. Her respiratory quotient was 0.84. The case was presented as one of low metabolic rate with no evident cause for it. Dr. Christian suggested that starvation is a large element in the cause.

The second case was presented by Dr. Scarff of the surgical service. The patient was a 13 year old girl who came into the hospital because of failing vision. Examination of the eyegrounds showed primary optic atrophy. A bitemporal hemianopsia was present Her B. M. R. was —37. She developed polydipsia and polyuria. Investigation showed that she had been taking large doses of posterior pituitary lobe extract for five years. Dr. Cushing pointed out that although pituitary extracts are destroyed in the stomach, such large quantities had been taken in this case that some absorption had occurred. He also emphasized the fact that when the pituitary is out of operation, the thyroid is atrophic, with the reverse being true. This explains the metabolic rate.

Dr. Benedict defined the respiratory quotient as the ratio between the amount of CO_2 given off to the amount of O_2 absorbed in a given unit of time. The respiratory quotient has been determined for quite a few years, but it took a long time before its relation to the foods eaten was appreciated. Since the protein R. Q. varies so much, and the carbohydrate and fat R. Q. remain constant, the custom has arisen to figure the non-protein R. Q. The figuring of the R. Q. depends on the determination of the O_2 and CO_2 which is rather difficult. With the modern methods their determinations may be found within an error of one per cent. of the total gas.

There are several difficulties in the determination of the R. Q. The main difficulty is the presence of much labile CO_2 in the body which can be blown off, thus greatly influencing the R. Q. Another error is the depth of breathing which variation must be carefully controlled. The mechanical difficulties have been largely overcome. The respiration chamber is frequently used, with test periods of one hour. The criticism is that the subject breathes the same air over again to a more or less extent so that the CO_2 stimulates breathing. The apparatus used by Dr. Benedict consists of an intake pipe, the amount of air sucked in being regulated by a motor. The air passes to the patient whose head is inside an inverted pail with a rubber diaphragm to close the bottom of it around the neck. The air is then conducted by another suction motor to the sampling bag, the excess being conducted through a recording meter and then back around the sampling bag so that the composition both inside and outside of the bag is the same. The air from the sampling bag is then taken into a Haldane gas sampler and is analyzed at leisure with the Haldane gas-analysis apparatus.

Dr. Benedict pointed out several details which must be appreciated. After muscular labor with its

accompanying burning of carbohydrates the R. Q. returns to normal again; this is due, according to A. V. Hill and others, to the reoxidation of substances (mainly lactic acid) made during exercise. Another point is that altered mechanics of respiration seem to have no very great effect on the R. Q. Something which must be carefully watched is that the subject of the experiment does not go to sleep because this materially changes the R. Q.

In addition to demonstrating his own apparatus for the sampling of breathed air, Dr. Benedict showed the apparatus used in measuring O_2 consumption.

In conclusion, he pointed out that the most pronounced value of the determination of the R. Q. is the hint which it gives as to the kind of food being burned in the body. The apparatus is not yet perfect enough for pathological work nor are very many good gas analysts available.

Dr. Benedict illustrated his talk by graphs made in his own laboratory. The paper was followed by a very interesting discussion by Drs. Cannon, Cushing, and Joslin.

NEW ENGLAND HEART ASSOCIATION

One of the most interesting and instructive meetings of the year was that of the New England Heart Association held at the Children's Hospital on the evening of December 20, 1928. Dr. W. H. Robie presided and introduced the speakers.

The first paper "The Serum Treatment of Rheumatic Fever" was presented by Dr. Sidney D. Kramer. The bacteriology of rheumatic fever, according to Dr. Kramer, dates back to the end of the 19th century. Nothing very definite was done until 1927 when Small announced the discovery of the causative agent and a serum treatment for the disease. He claimed: (1) that rheumatic fever was of an infectious nature; (2) that the causative agent was streptococcus of the gamma type; (3) that he had produced an anatoxin; (4) that his soluble vaccine could be used for active immunity. Birkhaug then came forth with the statement that rheumatic fever was a toxemia with an allergic reaction and Zinsser also expressed his belief that allergy was the basis of rheumatic fever.

The experiments which Dr. Kramer performed were done on fifteen cases showing polyarthritis, chorea, or mixed symptoms, on whom Small's serum was used. The criteria for the diagnosis of rheumatic fever were listed as follows: recurring tonsillitis, shifting arthritis, frequent nodules on the tendon sheaths, frequently associated with Sydenham's chorea, frequently complicated by carditis, recurrent attacks and exacerbations, low fever, moderate leucocytosis, various skin manifestations, and Aschoff bodies found in the myocardium at autopsy. The main difficulties which arose were the lack of confirmatory laboratory tests, and the late entrance of the cases into the hospital. The criteria for determining the effects of treatment were: duration and extent of the fever, change in white count, duration of symptoms, exacerbations and recurrences, presence or development of agglutinins in the blood, and the opsonic index.

Controls of untreated cases were run side by side with those treated with the serum. The results showed an extreme variation in the duration of the attacks, which ranged from 14 to 324 days. The serum was given from the 11th to the 312th day after the onset, but little difference was noted between the treated and untreated cases after its administration. The duration of the illness had no relation to its severity. The illness ended with or without complications, the end being unforeseen. Recurrences varied from six months to four years after the initial illness. The serum had little or no effect on the temperature, white count, or pulse while the nodules were still present. Agglutinins were rarely found in the blood. Only one of the treated cases had an exacerbation, while three of the untreated cases suffered in that way.

Dr. Kramer drew the following conclusions. The experiments bring out the marked variability of the disease. There is no rapid improvement following the use of the serum. There is no marked change in the white count, or marked increase in the agglutinins in the blood. One cannot draw conclusions from the absence of exacerbations in treated cases because only a small number of cases were tried and these only over a small period of time.

The second paper, "The Allergic Conception of Rheumatic Fever" was presented by Dr. Clifford L. Derick. The similarity of rheumatic fever to other diseases was pointed out by him. Since subacute bacterial endocarditis is often lighted up by an attack of rheumatic fever, a relation has been alleged. In lues and tuberculosis the results are far from the initial lesion and both give an allergic reaction; in these respects they resemble rheumatic fever.

In experimental animals a joint sensitization to the streptococcus can be produced. If the animals are injected intravenously with a toxic streptococcis filtrate, they die in 24-48 hours and at autopsy show hemorrhages into bone, enlargement of lymph nodes and thymus with all the other results found in tuberculin shock. Tests similar to the tuberculin test can be done. Three types of skin reactions are recognized: the normal, where a small, red, slightly edematous area results; the hypersensitive, where a large very red and edematous, tender area is found; and last, the immunity reaction where a small, firm nodular lesion results. In animals not highly sensitized, the hypersensitivity disappears in about nine weeks. Highly sensitized animals can be rendered easily immune with small injections of killed cultures. If a focus of subcutaneous infected agar be left, hypersensitivity results in that animal.

In patients the same reactions are obtained. Almost all of them have foci of infection sensitizing the body to the streptococci. They are found to react to the nucleoproteins of all kinds of streptococci. Intravenous inoculation of killed streptococci show a response similar to tuberculin. If carefully graded doses are given, the patients lose their sensitiveness and no longer respond to the injection and skin tests.

The complications of rheumatic fever, namely arthritis, nephritis and carditis, are very similar to those found in scarlet fever. Since those in scarlet fever are claimed to be of an allergic nature and lesions similar to Aschoff bodies are found in the myocardium at autopsy, another link in the chain of evidence to support the allergic theory of the cause of rheumatic fever is forged.

Recently two types of sensitiveness have been reported, one to a neutralizable toxin, the other to an unneutralizable toxin. Two types of streptococci have been suspected as the causative agents. The state of the tissues of the host probably plays a large part in the manifestations of the disease.

Dr. Derick concluded that rheumatic fever results from repeated low grade infections from foci in the body. If immunity has been established, the streptococci cause the minimum injury to the tissues.

The papers were followed by a very interesting discussion led by Dr. K. D. Blackfan.

NEW YORK ACADEMY OF MEDICINE

The New York Academy of Medicine and its affiliated societies will hold an annual meeting on January 3. Dr. John A. Hartwell will be inducted as president to succeed Dr. Samuel W. Lambert. At the joint meeting of the Section of Otology and Neurology and Psychiatry on January 11, Dr. Harry P. Cahill, of Boston, will read a paper on the treatment of otological brain abscess. Dr. Fred B. Lund, of Boston, will read a paper on medicine in the study of the classics before the Section of Historical and Cultural Medicine on the same date.

THE MASSACHUSETTS SOCIETY OF EXAMINING PHYSICIANS

This Society will conduct a meeting at the Copley-Plaza Hotel January 2, 1929, at 6:30 P. M.

Dr. Harold Rypins, Secretary of the New York Board of Medical Examiners, will report the experience in New York State resulting from the adoption of the law requiring the annual registration of physicians.

Discussion by A. S. Begg, Dean, Boston University School of Medicine.

Mrs. Emma S. Tousant, a member of the Massachusetts Industrial Accident Board, will speak on the Practice of Law and Medicine Today. Is It a Business or a Profession? Discussion by Frank W. Grinnell, Member and Secretary of Judicial Council.

Doctors are invited.

These are two important topics at the present time and will be of especial interest to physicians.

ESSEX NORTH DISTRICT MEDICAL SOCIETY

The 87th semi-annual meeting of this society will be held in Centre Church vestries, Main Street, corner of Vestry Street, opposite City Hall, Haverhill, Mass. (Tel. 548), Wednesday, January 2, 1929.

Dinner will be served at 12:30 sharp.

Following the dinner, the business meeting will occur, after which these speakers will address us:

1. J. Dellinger Barney, M.D., of Boston, Assistant Professor of Genito-Urinary Surgery at Harvard University Medical School, upon Infections of the Urinary Tract; Their Diagnosis and Treatment, with lantern slides. (40 minutes.)

2. Horace D. Arnold, M.D., of Boston, member of the Massachusetts Board of Registration in Medicine, upon Some Aspects of the Work of the Board. (30 minutes.)

3 (a). John W. Bartol, M.D., of Boston, Ex-President of the Massachusetts Medical Society, President of the Boston Medical Library, and Campaign Chairman of the United Building and Endowment Fund of the Boston Medical Library and Massachusetts Medical Society, and

(b.) Mr. Frederic H. Kent of Boston, Campaign Director, will each speak in reference to the fund.

Discussions are invited upon the above matters.

The annual assessment may be paid at this meeting ($8).

GUSTAVE E. KURTH, M.D., *President.*

Dec. 27, 1928.

J. FORREST BURNHAM, M.D., *Secretary,*
567 Haverhill Street, Lawrence, Mass.

SOCIETY MEETINGS

Combined Meetings of the Boston Medical Library, the Suffolk District Medical Society, the Middlesex South District Medical Society and the Norfolk District Medical Society (at Boston Medical Library at 8:15)

January 30, 1929—General meeting in association with Boston Medical Library. "Heredity," Professor George H. Parker, Harvard University.

February 27, 1929—Medical Section. "The Newer Knowledge of Nutriment," Dr. Lafayette B. Mendel (exact title to be submitted later), Yale University Medical School.

March 27, 1929—Meeting in association with Middlesex South District Medical Society. Clinical and Experimental Studies of Obstructing Jaundice and Its Complications. Dr. Waltman Walters, Mayo Clinic.

April 24, 1929—Annual meeting. Speaker, Dr. Walton Martin, New York City. Title to be announced later.

The medical profession is cordially invited to attend all these meetings.

January 2—Massachusetts Society of Examining Physicians. Detailed notice appears elsewhere on this page.

January 29—Conference on Mental Hygiene in Public Health and Social Work. Detailed notice appears on page 1235, issue of December 13.

DISTRICT MEDICAL SOCIETIES

Barnstable District Medical Society

Schedule of Meetings: February 7, 1929, May 2, 1929.

Bristol North District Medical Society

April 18, 1929—Spring meeting.

Essex North District Medical Society

January 2, 1929 (Wednesday)—Semi-annual meeting at Haverhill, at 12:30 P. M. Detailed notice appears elsewhere on this page.

May 1, 1929 (Wednesday)—Annual meeting at Lawrence, at 12:30 P. M.

May 2, 1929 (Thursday)—Censors meet at Hotel Bartlett, 95 Main Street, Haverhill, at 2 P. M. (Tel. 3430.)

Essex South District Medical Society

January 2, 1929 (Wednesday)—Hawthorne Hotel, Salem. Dinner at 7 P. M. Symposium on Gall Bladder Disease. Speakers: Dr. Chester Jones, Boston, Diagnosis of Gall Bladder Disease, and Differential Diagnosis in Jaundice. Dr. Paul Butler, Boston, X-ray in Gall Bladder Disease. Dr. Frank Lahey, Boston, Surgery of Gall Bladder.

February 6, 1929 (Wednesday)—Council meeting, Boston.

February 13, 1929 (Wednesday)—Danvers State Hospital. Clinic at 4 P. M. Supper at 6 P. M. Speaker: Dr. Roger Lee, Boston; subject to be announced later. Discussion from the floor.

March 6, 1929 (Wednesday)—Lynn Hospital. Clinic at 5 P. M. Dinner at 7 P. M. Symposium on Pneumonia. Speakers: Dr. Reginald Fitz, Diagnosis. Dr. Fred Lord,

Treatment. Dr. William H. Roble, Heart in Pneumonia. Discussion from the floor.

RALPH E. STONE, M.D., Secretary.

Franklin District Medical Society

Meetings will be held on the second Tuesday of January, March and May.

Hampden District Medical Society

The next meeting will be held January 22. Additional notices will appear later.

Hampshire District Medical Society

March 13, 1929—Address by Dr. George E. Gage, Professor of Bacteriology and Physiology at the Massachusetts State College.

Middlesex East District Medical Society

The following schedule of meetings has been arranged for the coming year:

January 16—Wakefield.
March—Reading.
May—Melrose.

Subjects and speakers to be arranged by committees in each city or town.

Middlesex North Medical Society

The winter meeting will be held the last Wednesday in January.

The annual meeting will be held the last Wednesday in April.

Middlesex South District Medical Society

March 27, 1929—Joint meeting with the Suffolk and Norfolk Districts.

April, 1929—Annual meeting. Definite date to be announced later.

Norfolk District Medical Society

Below are the proposed meetings of the Norfolk District Medical Society for the 1928-29 Season. The schedule below will be adhered to as strictly as possible. The carrying out of the proposed plan will, of course, depend upon the acceptances of invitations extended to the speakers. Minor changes may be necessary.

January 29—Roxbury Masonic Temple. Subject, Treatment of Varicose Veins by the Injection Method—Dr. E. E O'Neil. Dr. Homans will open the discussion.

February 25—Roxbury Masonic Temple. Dr. W. R Ohler. Subject to be announced. Discussion to be opened by Dr. A. A. Hornor.

March 29 — Roxbury Masonic Temple. Subject and speakers to be announced.

May—Annual meeting program to be announced.

The Censors of the Society meet May 9, 1929, at the Roxbury Masonic Temple, Warren Street, Roxbury, at 4 P. M., for the examination of candidates.

Plymouth District Medical Society

January meeting, Thursday, January 17, 1929, at 11 A. M., Brockton Hospital, Brockton, Mass. Speakers: Dr. Michael F. Fallon, Chief of Surgical Staff, St. Vincent Hospital, Worcer, Mass.; Dr. Edw. J. Denning, Chief of Medical Staff, Carney Hospital, Boston, Mass.; subject to be announced later.

March meeting at the Moore Hospital, Brockton, Mass., March 21st, program to be announced later.

April meeting at the Commercial Club, Brockton, April 18th, at 6 P. M. Annual Oration by Dr. Ralph C. McLeod, Orator; dinner.

Suffolk District Medical Society

March 27, 1929—Meeting in association with Middlesex South District Medical Society. "Clinical and Experimental Studies of Obstructive Jaundice and Its Complications," Dr. Waltman Walters, Mayo Clinic.

April 24, 1929—Annual meeting. Speaker, Dr. Walton Martin, New York City. Title to be announced later.

LINCOLN DAVIS, M.D., President.
ARTHUR H. CROSBIE, M.D., Secretary.

Worcester District Medical Society

January 9, 1929—Chamber of Commerce, Worcester. Dr. Leon T. LeWald of New York City.

February 13, 1929—Worcester State Hospital. Program to be announced.

March 13, 1929—Worcester City Hospital. Dedication of New Nurses' Home. Speaking program to be announced.

April 10, 1929—Grafton State Hospital. Program to be announced.

May 8, 1929—Annual meeting. Worcester Country Club.

Worcester North District Medical Society

January 22, 1929 (Tuesday)—At Henry Heywood Memorial Hospital, Gardner, by invitation. Program by Staff.

Annual meeting the fourth Tuesday in April.

BOOK REVIEWS

Urology. By EDWARD L. KEYES, M.D. Published by D. Appleton and Company, New York. 763 pages.

This is the fifth edition of Dr. Keyes well known text book on Urology. As in the previous editions the author covers the entire subject in a clear and pleasing manner. The chapters of the revised editions have been rearranged and added to, and line drawings have been substituted for the usual x-ray plates to give a new clearness to the text. Of particular interest, not only to the urologist, but also to the general practitioner, is the résumé of our present knowledge of infection of the upper urinary tract. Dr. Keyes has summarized the facts and theories relating to this important subject with brevity and clearness. Students should enjoy the readability of this book and profit by the soundness of the views expressed by the author. It has always been a pleasure to recommend Keyes' Urology to our own medical students; the new edition has all the charm of the former ones with many valuable additions.

Précis de Pathologie Chirurgicale. 6 volumes. Masson & Cie. Paris. 1928.

This group of six small volumes is a very useful summary of surgical pathology written in the usual lucid French style and containing numerous intriguing, if not always enlightening, speculations. This represents the fifth edition of this series.

The volumes, which are sold separately, take up the following subjects:

Volume 1. General Surgical Pathology.

Volume 2. Surgical Pathology of the Head and Spine.

Volume 3. Surgical Pathology of the Neck, Thorax and Breast.

Volume 4. The Abdomen.

Volume 5. Genito-urinary and Gynecological Pathology.

Volume 6. Fractures and Dislocations, and Pathological Lesions of the Extremities.

These books give not only the pathological aspect but a short summary of the generally accepted types of treatment, and discuss also very briefly the clinical aspects. They are of considerable interest as

giving apparently a very fair bird's eye view of the surgical procedures and pathological viewpoints generally accepted in France at the present time.

A Text Book of Surgery. By W. WAYNE BABCOCK.

"A Text Book of Surgery" is divided into four parts: General Surgery, The Surgery of the Systems, Surgical Technique and Regional Surgery,—the latter division occupying half the entire volume. Under these four major divisions the author considers such diverse topics as the central nervous system, fractures and dislocations of the extremities, and the genito-urinary system. In order to present so wide a field, the outline method, with its obvious limitations, is used. Not the least of the objections to this method is the didactic manner in which many controversial points must be treated; and bearing this in mind one is not surprised to find many statements by the author to which strong exception might be taken. If, however, the book as a whole is considered, one is struck by the large amount that has been included and the clearness with which the material is presented. This result is reached by a concise method of statement and a free use of diagrams and illustrations. This use of diagrams and illustrations—which are particularly good and contain a minimum number of the pathological curiosities which so frequently predominate in text-books of surgery—has made this volume especially valuable as a handy reference book.

The present high degree of specialization in the different regional fields of surgery has placed such a mass of detailed information and classification before the profession that it is almost if not altogether impossible for any one author to present the best of contemporary practice in all departments; but at least he can furnish his perspective for viewing the relation of the surgical specialties to the fundamental field of general surgery. There is also unquestioned benefit to the profession in having a surgeon of wide experience put on record his views, emphasizing the points which he has found of value in his practice.

Diabetic Manual for Patients. HENRY J. JOHN, M.D.

During the last few months several new diabetic manuals have been published, each one reflecting the method of treatment and instruction used by each author. Dr. John is Director of the Diabetic Department and Laboratories of the Cleveland Clinic and his book seems unusually practical. It is attractively and helpfully illustrated by diagrams and charts which enable the patient to visualize the procedures. The text is simply and concisely worded and the usual questions which arise in the minds of diabetic patients are answered in an unusually satisfying way. Diabetic arithmetic and the use of insulin are very well handled. The appendix contains valuable food charts and various recipes approved by the author. Drawings of various foods showing the content of carbohydrate, protein and fat in color are a startling innovation in food tables and may be of great help to certain patients, but many will feel that the space required might have been more profitably utilized. The appendix also contains 16 sample diets prepared by Miss Laura Soden, dietitian in the Diabetic Department of the Cleveland Clinic. The book is practical and usable and will be of real help to both patient and physician, not only in diabetes, but in any disease in which knowledge of food values is necessary.

BOOKS RECEIVED FOR REVIEW

Partnerships, Combinations and Antagonisms in Disease. Edited by Edward Ibotson. Published by F. A. Davis Company. 348 Pages. Price $3.00.

The Kahn Test.—A Practical Guide. Edited by R. L. Kahn. Published by Williams & Wilkins. 201 Pages. Price $4.00.

Thrombo-Angiitis Obliterans. Edited by George E. Brown and Edgar V. Allen. 219 Pages. Price $3.00.

Leucoplasie et Kraurosis Vulvaires. Edited by C. Sobre-Casas and Felipe F. Carranza. Published by Masson et Cie. 119 Pages.

Revision de la Doctrine des Localisations Cerebrales. Edited by R. Brugia. Published by Masson et Cie. 195 Pages.

Le pH en Biologie. Edited by Marcel Verain et Jean Chaumette. Published by Masson et Cie. 159 Pages.

Organic Laboratory Methods. Edited by Professor Lassar-Cohn. Published by Williams & Wilkins Company. 458 Pages. Price $6.50.

Nouveau Traite de Medecine. Edited by Roger, Widal, and Teissier. Published by Masson et Cie. 1048 Pages.

Acute Infectious Diseases. Edited by Jay Schamberg and John A. Kolmer. Published by Lea & Febiger. 888 Pages. Price $10.00.

Diabetic Surgery. Edited by Leland S. McKittrick and Howard F. Root. Published by Lea & Febiger. 269 Pages. Price $4.25.

Public Health and Hygiene. Edited by William H. Park. Published by Lea & Febiger. 902 Pages. Price $9.00.

Sterility in Woman. Edited by Sidney Forsdike. Published by William Wood & Company. 133 Pages. Price $3.50.

Ultra-Violet Radiation and Actinotherapy. Edited by Eleanor Russell and W. Kerr Russell. Published by William Wood & Co. 648 Pages. Price $6.50.

Röntgenology. Edited by Alban Kökler. Published by William Wood & Company. 556 Pages. Price $14.00.

AT THE MENOPAUSE

The distressing symptoms that so frequently accompany the climacteric, but more particularly the aggravated symptoms of the artificial menopause, are often controlled by the administration of

LUTEIN TABLETS, H. W. & D.
LUTEIN SOLUTION AMPULES, H. W. & D.

The choice of the medication depends, of course, on the judgment of the physician as to whether oral or hypodermic administration is indicated. Both products represent the

Corpus Luteum of the Sow

unmodified by treatment with solvents or by exposure to temperatures above animal body heat in the drying process. All separation of extraneous matter is made by mechanical means and all drying is in vacuo. The unaltered corpora-lutea should, therefore, be presented in our products and clinical experiences with them should demonstrate their therapeutic activity.

Ovarian dysfunction as evidenced in dysmenorrhea and amenorrhea is also an indication for Lutein medication, and if the diagnosis of such dysfunction is reasonably well established, definite therapeutic results may be expected.

WHOLE OVARY TABLETS, H. W. & D.
OVARIAN RESIDUE TABLETS, H. W. & D.

are also offered to those who prefer, for certain indications, the use of the whole gland or of the residue remaining after corpus luteum separation.

Literature furnished on request

H. W. & D.—SPECIFY—H. W. & D.—SPECIFY—H. W. & D.—SPECIFY—H. W. & D.

HYNSON, WESTCOTT & DUNNING

BALTIMORE

The Waltham Training School For Nurses

FORTY-FIFTH YEAR

Spring Term Begins February 1, 1929

Three Years Course

Two years in the Waltham Hospital following a half year preparatory course. Training for last half year of the course is devoted to private nursing. Allowances provided for necessary expenses.

For further information apply to:

Dr. Alfred Worcester, President

or to

Miss Beatrice DeVeber, Principal

WALTHAM, MASSACHUSETTS

STAINLESS SURGICAL NEEDLES

Always bright and sharp. Will bend before they break.

We sell the

Anchor Brand

Made of finest quality STAINLESS STEEL.

All the principal styles.

Price per dozen $1.50

Codman & Shurtleff, Inc.

171 Mass. Ave., Boston, Mass.

(Established 1838)

— PROFESSIONAL CARDS —

Established 1879

RING SANATORIUM AND HOSPITAL, Inc.

Eight Miles from Boston

For Chronic, Nervous and Mild Mental Illnesses. Six separate houses permit of segregation and a variety of accommodations, including suites.
Arthur H. Ring, M.D., Supt.
Freeman A. Tower, M.D., Medical Director.
Barbara T. Ring, M.D., Treas.
Telephone Arlington 0081.
Boston Office: 490 Commonwealth Ave.
By Appointment.
Telephone Kenmore 2770.

Dr. Mellus' Private Hospital

FOR MENTAL DISEASES

419 Waverley Avenue, Newton, Mass.

Reached by train to Newton, or by electric cars via Commonwealth Avenue to Grant Avenue.

Edward Mellus, M.D.

DR. TAYLOR'S PRIVATE HOSPITAL

For the Treatment of
NERVOUS DISEASES
Alcoholism and Drug Addiction

House newly equipped and furnished, skilled attendants, good food, and comfortable rooms at moderate rates.

Methods of treatment are those proved best after 20 years' successful experience.

FREDERICK L. TAYLOR, M.D.
45 Centre St., Boston 20, Mass.
(Near Dudley St. Terminal) (Roxbury District)

Mrs. Spinney's House

For the care of medical and surgical convalescents, elderly persons and chronic cases. Attractive rooms, and piazzas, spacious grounds. Excellent food. 15th year.

MARY E. H. SPINNEY
17 Parley Vale, Jamaica Plain, Mass.
Tel. Jam. 2280

WESTWOOD LODGE

A modern private sanatorium within fifteen miles of Boston, for the treatment of nervous and mild mental diseases; also for those in need of rest under medical supervision. Separate buildings make possible a satisfactory grouping of patients. The buildings, which include one devoted exclusively to occupational therapy, are surrounded by over one hundred acres comprising woodlands, gardens and pine groves.

WM. J. HAMMOND, M.D., *Superintendent*
WESTWOOD, MASSACHUSETTS

WOODLAWN SANITARIUM

FOR THE CARE OF EPILEPTICS
Dora W. Faxon, M.D.
WEST NEWTON, MASS.

Wiswall Sanatorium

Inc.

A Sanatorium for the Treatment of Nervous and Mental Diseases

New Buildings, every facility for comfort; in the midst of twelve acres of high land, covered with beautiful oak and pine trees; fully equipped for hydrotherapeutic and electrical treatment.

H. O. SPALDING, M.D.
Superintendent
E. H. WISWALL, M. D.
Asst. Physician
Wellesley, Mass.
Telephone Wellesley 261

STAMFORD HALL

STAMFORD, CONN.

Phone 70

For the scientific treatment of Nervous and Mental diseases. Drug and Alcoholic addictions, and General Invalidism. Completely equipped for the care and comfort of patients — Hydro and Electro Therapy, Massage, Occupational Therapy, and Amusements, also Pathescope Motion Pictures.

Located in a beautiful natural park of 100 acres, with numerous detached buildings, insuring privacy.

Five hours from Boston and three hours from New London on the New Haven Railroad.

Address
Frank W. Robertson, M.D., Med. Dir.

WOODSIDE COTTAGES

Framingham, Massachusetts

Located on high ground, adapted to the care of chronic, convalescent and rest cases, and the aged. Committed cases not received.

FRANK W. PATCH, M.D.
Founder
F. C. Southworth, M.D., Superintendent

NURSING HOME

A pleasant home for convalescent invalids and elderly people. Large sunny rooms, piazzas and attractive grounds in a quiet neighborhood. Resident physician's services optional.

LUCIA F. VICKERY, M.D.
37 Greenough Ave.,
Jamaica Plain, Mass.
Tel. Jam. 0072.

B672-29-tf

Herbert Hall Hospital, Inc.

WORCESTER, MASS. Established in 1875

A hospital for the Care and Treatment of those afflicted with the various forms of Nervous and Mental Diseases. Accommodations for a few chronic quiet patients at special rates.
Walter C. Haviland, M.D., Superintendent

O. R. T. L'ESPERANCE, M. D.
Hours 1 to 8
100 Boylston St., Boston—Tel. Hancock 0197
Genito-Urinary Diseases
Specialty Gonorrhoea

Perkins School of Adjustment

LANCASTER, MASS.

A School for Children requiring special methods of training and education

Unsurpassed Equipment on 60 Acre Campus—Intimate Home Life

Experienced Staff Medical Direction

FRANKLIN H. PERKINS, M.D.

GLENSIDE

Jamaica Plain, Boston, Mass.

A small, attractively located sanitarium for nervous, mild mental or chronic illnesses.

MABEL D. ORDWAY, M.D.
6 Parley Vale Tel. Jamaica 44

TRUMBULL HOSPITAL

68 Allerton St., cor. Pond Ave.
BROOKLINE, MASS.

Pleasant, attractive Private Rooms for Surgical and Medical Cases

X-Ray, Electrotherapy and Laboratory facilities provided

Attractive location overlooking Leverett Pond, Jamaica Parkway

Telephone Regent 2841-2842

THE PINES

An exclusive private home for five invalids or elderly people. Physicians' references.

MISS CORA D. COLLUPY
203 Park Ave., Arlington Heights, Mass.
Tel. Arlington 947-W

B87-19-13t

BOSTON UNIVERSITY SCHOOL OF MEDICINE

Organized In 1873

ANNOUNCEMENT

may be obtained by application to

THE REGISTRAR

80 East Concord Street, Boston, Mass.

CHANNING SANITARIUM, Inc.

Wellesley Ave., Wellesley, Massachusetts

(Established in Brookline 1879. Transferred to Wellesley 1914.)

Ten new buildings on fifty acres of high woodland, especially designed and built for the care and treatment of nervous cases. Six dormitory cottages. Separate cottage for occupational therapy. Ample accommodations and modern equipment for thirty-five cases.

CLIFFORD G. ROUNSEFELL, M.D. *Resident Physician*

DONALD GREGG, M.D. *Superintendent*

PALMER MEMORIAL HOSPITAL

197 Pilgrim Road, Boston, Mass.

OUT-PATIENT CLINICS FOR DIAGNOSIS AND EARLY TREATMENT

Tuesday, 9-11 A. M. Arthritis and colitis.
Tuesday, 4-5 P. M. Tumors of female genitalia, uterine bleeding.
Wednesday, 2-3 P. M. Leukemias, anemias, and Hodgkin's disease.
Thursday, 3-5 P. M. Tumors of skin, mouth, breast and internal organs.
Friday, 4-5 P. M. Tumors of genito-urinary system. Tumors of ear, nose and throat.

Charge for examination, $5.00. Radium treatments $5.00 and up, according to amount of radiation. Special procedures extra. Free service for those who cannot pay.

Each patient is expected to bring note of reference from his physician.

Take Brookline Ave. car to Francis St. or Boston & Albany R. R. to Longwood Station.

BREAST MILK

may always be obtained at the offices of

The Directory, Inc.

(For Mothers' Milk)

270 Commonwealth Avenue, Boston

Tel. Back Bay 10,100

Sent packed in ice to all parts of New England

Formerly The Directory For Wet Nurses, Inc.

Massachusetts General Hospital

Pay Consultation Clinic
For People of Moderate Means

Tuesday and Friday Afternoons

Admission is by appointment only, with letter from physician. NO TREATMENT GIVEN.
PATIENT REFERRED BACK TO THE PHYSICIAN.
Admission fee $10. Laboratory fees, X-rays, etc., extra.
For further particulars, write to the Hospital, attention of the Consultation Clinic.

F. A. Washburn, M. D.
Director

NEW ENGLAND SANITARIUM and HOSPITAL

Stoneham (P. O. Melrose), Mass.

Picturesque location on the shores of Spot Pond eight miles from Boston.

One hundred forty Pleasant, Home-like Rooms, a la Carte Service. Six Resident Physicians, Seventy Trained Nurses. Experienced Dietitians and Technicians.

MEDICAL, SURGICAL and MATERNITY CASES RECEIVED

Scientific Equipment for Hydrotherapy, Physiotherapy and X-Ray. Occupational Therapy, Gymnasium, Golf, Solarium. Full health examinations and careful diagnosis. No Mental, Tubercular or Contagious cases received.

Physicians are invited to visit the institution. Ethical co-operation.

For booklet and detailed information address:

Virgil L. Fisher, M.D.
Medical Director

BOURNEWOOD HOSPITAL

300 SOUTH STREET, BROOKLINE, MASSACHUSETTS
Established 1884

For a limited number of cases of Mental and Nervous Diseases.
Post Office, Chestnut Hill. Telephone "Parkway" 0300.
Nearest station, Bellevue, N. Y., N. H. & H. R. R.

George H. Torney, M. D.

Leonard's Case History Series

A Textbook goes out of date. The longer you keep a Case History the more valuable it becomes.

DISEASES OF CHILDREN — Illustrated $7.50

By JOHN LOVETT MORSE, M.D., *Formerly Professor of Pediatrics, Harvard University.*
"A complete and up-to-date textbook on pediatrics."
—*Boston Medical and Surgical Journal.*

CASE HISTORIES IN NEUROLOGY — $4.00

By E. W. TAYLOR, M.D., *Professor of Neurology, Harvard Medical School.*
Symptomatology, diagnosis, treatment and pathological findings in the disorders of the nervous system.

ONE HUNDRED SURGICAL PROBLEMS — Illustrated $4.00

By JAMES G. MUMFORD, M.D., *Visiting Surgeon to the Massachusetts General Hospital.*
"A vast amount of surgical knowledge not readily accessible to the average practitioner."—*Medical Times.*

PULMONARY TUBERCULOSIS — Illustrated $3.50

By EDWARD O. OTIS, M.D., *Professor of Pulmonary Diseases, Tufts Medical College.*
Principles underlying the splendid crusade that reduced deaths from Tuberculosis 28% in Massachusetts.

NEUROSYPHILIS — Illustrated $5.00

By DRS. E. E. SOUTHARD AND H. C. SOLOMAN.
"A textbook which richly fulfills its function."
—*Journal of the American Medical Association.*

SHELL SHOCK AND NEUROPSYCHIATRY — Illustrated $10.00

By ELMER E SOUTHARD, M D.
"Every student of neurology, of psychiatry, of internal medicine should read carefully and digest every one of the nine hundred pages."—*Dr. D. O. McCarthy, Neurologist, Philadelphia General Hospital.*

DISEASES OF WOMEN — Illustrated $6.00

By CHARLES M. GREEN, M.D., *Professor of Obstetrics and Gynecology, Emeritus, Harvard University.*
"This is a book to keep at your elbow where it can be picked up at a moment's notice."—*Journal of the Medical Society of New Jersey.*

OBSTETRICS — Illustrated $5.00

By ROBERT L. DENORMANDIE, M.D.
"A valuable compend of practical obstetrics."—*Journal of Medical Sciences.*

THE NEW ENGLAND JOURNAL OF MEDICINE,
126 Massachusetts Ave., Boston

Enclosed find.....for which send me copies of books checked above.

Name .....

Address .....

40th Thousand

THE ALLEN TREATMENT OF DIABETES
$1.75

The Book Department operates on such a narrow margin that it is impossible to send books on approval, to allow returns, or to open charge accounts.

Where alkaline treatment is indicated

KALAK WATER

makes possible the administration of alkalies in large amounts and in agreeable fashion.

More logical than the single alkali (like sodium bicarbonate) Kalak Water contains several elements needed for maintaining the normal alkali reserve of the body.

Each bottle contains in sparkling form the bicarbonates of sodium, potassium, calcium and magnesium.

Kalak Water offers the strongest alkaline water of commerce.

KALAK WATER CO., 6 Church St., New York City

THE NEW ENGLAND JOURNAL OF MEDICINE

(Formerly the Boston Medical and Surgical Journal)

(Established 1828)

126 Massachusetts Ave., Boston 17, Mass.

Subscription Price $6.00 per annum.
Canadian Postage $1.04, Foreign Postage $1.56 per annum.
Circulation December, 1926—5678.

Owned and Published by the Massachusetts Medical Society.
Issued Weekly on Thursday.

1. General Advertising:

	1 Page	½ Page	¼ Page	⅛ Page
One Week	$ 42.00	$ 27.00	$ 14.75	$ 8.00
One Month	152.00	97.00	53.00	28.40
Per Insertion	38.00	24.25	13.25	7.10
Three Months	442.00	279.50	152.75	81.90
Per Insertion	34.00	21.50	11.75	6.30
Six Months	728.00	455.00	247.00	139.10
Per Insertion	28.00	17.50	9.50	5.35
One Year	1092.00	702.00	382.20	205.40
Per Insertion	21.00	13.50	7.35	3.95

Preferred Space. First Cover—add 100% to above rates; Fourth Cover—add 100%; Facing First text page—add 50%; Facing Last text page—add 33 1/3%; Special position on any other advertising page—add 10%.
Cash Discount, 5% 10 days.

2. Physicians' cards*:
¾ inch space. 75c per three line insertion, $30.00 per year.

3. Classified advertising (Special page) at the following rates*:
1st insertion, 20c per 6 point line. 2d, 3d and 4th insertion @ 15c per line for each insertion. 10c per line for each insertion thereafter. Mailing Service, 15 cents additional.

4. The right is reserved to reject any application for space.

5. Mechanical Requirements:
Width of page 7 ins. Depth of page 9 ins. Page space 7x9 ins. Half page, 7x4½ ins. or 3½x9 ins. Quarter page, 3½x4½ ins. or 2⅓x7 ins. Eighth page, 2⅓x3½ ins.
Closing date, one week in advance of date of publication.

*Not subject to discount